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COMBINATIONS OF ANTIBIOTICS IN THE TREATMENT OF INFECTIOUS DISEASES

WILLIAM E. WELLMAN, M.D.

Rochester, Minnesota

THE synergistic and antagonistic effects of one drug on another have been a subject of investigation and study for many years. With the advent of the antibiotics, similar investigation was undertaken. This paper concerns itself with the synergistic and antagonistic effects of combinations of the various antibiotics in common use today: penicillin, dihydrostreptomycin, aureomycin, chloramphenicol and terramycin.

Although combinations of penicillin and dihydrostreptomycin had been used more or less empirically by clinicians, Klein and Kimmelman in 1947 published data involving *in vitro* studies which demonstrated a synergistic effect between these two drugs. They found that, in combination, these two substances left a residuum of viable resistant bacteria. However, these remaining bacteria were unable to multiply, the development of resistant forms thus being controlled. That this effect was indeed synergistic rather than merely additive was clearly demonstrated by Nichols in 1948. In the same year Spicer and Blitz found that although penicillin is bactericidal, it leaves a residuum of viable organisms which are destroyed when dihydrostreptomycin is used in combination with penicillin. Robbins,¹⁴ and Robbins and Tompsett,¹⁵ published two reports in 1949 in which they found a synergistic action of these two drugs for enterococci and *Streptococcus viridans*. In the same year Heilman showed that the most effective method of treating brucellosis in mice

was with a combination of aureomycin and dihydrostreptomycin.

In 1950 Jawetz and his colleagues^{1,8,10} found that combinations of penicillin and dihydrostreptomycin are synergistic because they increase the bactericidal rate. They also demonstrated an antagonism between penicillin and aureomycin or chloramphenicol. In other words, penicillin alone was more effective than when combined with either aureomycin or chloramphenicol. It had been established by Hobby and associates that penicillin is most effective when bacteria are multiplying actively. This being so, Jawetz and his co-workers have postulated that aureomycin and chloramphenicol are antagonistic to penicillin because they are bacteriostatic, thus inhibiting bacterial multiplication. These same authors found that dihydrostreptomycin paired with aureomycin and chloramphenicol, and aureomycin paired with chloramphenicol, showed no enhancing or antagonistic effect. Jawetz and Speck, studying streptococcal infections in mice, found that 20 per cent of the mice died after administration of penicillin or chloramphenicol alone, whereas 60 per cent died after administration of combinations of chloramphenicol and penicillin. Hunter,⁷ working with bacteria *in vitro*, confirmed the antagonistic effects of combinations of penicillin and aureomycin. He further noted that the combination of aureomycin and dihydrostreptomycin was effective against certain bacteria.

Herrell, Heilman and I presented data concerning the development of strains of *Escherichia coli* and *Aerobacter aerogenes* resistant to terramycin, aureomycin, chloramphenicol and dihydro-

From the Division of Medicine, Mayo Clinic, Rochester, Minnesota.

Read at the annual meeting of the Minnesota State Medical Association, Rochester, Minnesota, April 30, 1951.

COMBINATIONS OF ANTIBIOTICS—WELLMAN

streptomycin. As shown in Table I, strains made resistant to terramycin, to aureomycin and to chloramphenicol regularly showed an increased resistance to all three of these antibiotics but not

was treated with a combination of aureomycin and dihydrostreptomycin. Twenty-five of these patients had culturally proved brucellosis. In ten there was unmistakable evidence of brucellosis

TABLE I. INDUCED RESISTANCE TO TERRAMYCIN*

Organism and Strain	Made Resistant to:	Sensitivity in Micrograms per Milliliter			
		Terramycin	Aureomycin	Chloramphenicol	Streptomycin
<i>Escherichia coli</i> 687	0	3.12	6.25	6.25	12.5
	Terramycin	100	50	100	6.25
<i>Aerobacter aerogenes</i> 1,155	0	3.12	3.12	6.25	6.25
	Terramycin	50	50	200	6.25
<i>Streptococcus faecalis</i> 2,323	0	1.56	0.78	12.5	50
	Terramycin	12.5	6.25	12.5	50
<i>Escherichia coli</i> 2,300	0	1.56	3.12	12.5	6.25
	Aureomycin	100	100	100	3.12
<i>Aerobacter aerogenes</i> 2,319	0	1.56	3.12	6.25	3.12
	Aureomycin	100	50	200	0.78
<i>Escherichia coli</i> 994	0	1.56	3.12	12.5	6.25
	Chloramphenicol	50	25	200	6.25
<i>Aerobacter aerogenes</i> 1,155	0	3.12	3.12	6.25	6.25
	Chloramphenicol	6.25	12.5	200	3.12
<i>Escherichia coli</i> 1,120	0	3.12	3.12	12.5	12.5
	Streptomycin	1.56	1.56	6.25	200
<i>Aerobacter aerogenes</i> 1,158	0	1.56	1.56	3.12	12.5
	Streptomycin	1.56	0.78	1.56	200

*From Herrell, W. E.; Heilman, F. R., and Wellman, W. E.: Some bacteriologic, pharmacologic, and clinical observations on terramycin. *Ann. New York Acad. Sc.*, 53:448-458 (Sept. 15) 1950.

to dihydrostreptomycin. Strains made resistant to dihydrostreptomycin did not exhibit an increased resistance to the other three antibiotics. Not infrequently the induction of resistance to terramycin, aureomycin or chloramphenicol resulted in an increase in sensitivity to dihydrostreptomycin. Conversely, an increase in resistance to dihydrostreptomycin sometimes was accompanied by an increase in sensitivity to terramycin, aureomycin or chloramphenicol.

A few strains of *Streptococcus faecalis* and *Micrococcus pyogenes* have been made resistant to terramycin or to aureomycin. With these organisms the development of resistance to one of the drugs has caused a substantial increase in resistance to the other, but not to chloramphenicol or to dihydrostreptomycin.

I have reviewed these laboratory reports in an attempt to acquaint you with the facts supporting the clinical use of combinations of the various antibiotics. At present, data concerning the clinical use of combination therapy are still somewhat limited. There are, however, a few diseases in which the use of combined therapy seems justified.

The first disease falling in this category is brucellosis. In 1950 Herrell and Barber reported data on thirty-five patients in whom brucellosis

but no positive cultures were obtained. These thirty-five patients were all treated with a combination of aureomycin and dihydrostreptomycin and were followed, from three to nineteen months, with only one symptomatic relapse and no bacteriologic relapses. The dosage schedule was as follows: Patients with systemic or bacteremic brucellosis were given 3 gm. of aureomycin and 2 gm. of dihydrostreptomycin daily for twelve to fourteen days, while patients with localized lesions including those of the urinary tract, the skeletal system or the lymph nodes received 3 gm. of aureomycin and 1 gm. of dihydrostreptomycin daily for twenty-eight days. Aureomycin was administered in doses of 750 mg. every six hours; and 1 or 0.5 gm. of dihydrostreptomycin, depending on the duration of treatment, was given in the morning and evening. That this method of treatment is extremely satisfactory is evident from the fact that, of these thirty-five patients, all recovered and there were no bacteriologic relapses. It is my opinion that to date this is the method of choice in the treatment of brucellosis.

Combined therapy has also been found to be of value in the treatment of subacute bacterial endocarditis. The usual patient with endocarditis due to the various groups of streptococci responds

well to penicillin alone. However, there are about 3 to 10 per cent of these patients in whom the infection is caused by a highly resistant organism. These resistant organisms are classed as enterococci, of which *Streptococcus faecalis* is one of the commonest. In 1947 Hunter⁶ treated one patient who had subacute bacterial endocarditis due to *Streptococcus faecalis* with a combination of penicillin and dihydrostreptomycin. That this patient recovered was unusual, since very rarely had penicillin alone been successful.

However, in 1949, Robbins and Tompsett¹⁵ reported data on six patients with enterococcal bacteremia, five of whom had subacute bacterial endocarditis. Two of these patients received treatment only terminally, but four completed a course of from four to eight weeks and recovered. These four patients were followed from six to twelve months and none relapsed. The same authors¹⁶ in March, 1951, reported the results of combinations of penicillin and dihydrostreptomycin in nine patients with enterococcal endocarditis. Two patients received only a short course of therapy before death and were not considered as having had adequate therapeutic trials. Of the remaining seven patients, five recovered and two died. The recommended dosage schedule is 6,000,000 units of penicillin and 2 gm. of dihydrostreptomycin daily for twenty-eight to forty-two days. Five hundred thousand units of crystalline penicillin were given intramuscularly every two hours together with 0.5 gm. of dihydrostreptomycin four times daily.

Loewe and his colleagues also in March, 1951, reported data on four patients with enterococcal endocarditis who received both penicillin and dihydrostreptomycin. Two of these recovered and two died. The treatment period was from two to three weeks, and these patients received from 5,000,000 to 20,000,000 units of penicillin daily together with 1 to 2 gm. of dihydrostreptomycin. These authors recommended 10,000,000 units of penicillin daily given by the intravenous method. In their opinion dihydrostreptomycin should be added to the treatment only if penicillin alone fails to control the infection.

It is my opinion that at present the treatment of choice in enterococcal subacute bacterial endocarditis is a combination of penicillin and dihydrostreptomycin. The optimal dose of these two substances remains to be determined. I am also convinced that, when one is dealing with sub-

acute bacterial endocarditis due to an unknown organism, combinations of these two drugs should be used.

Three other diseases which deserve mention in this regard are bacteremia, peritonitis and meningitis. When the organism causing these infections is known, one can usually determine the antibiotic of choice with little difficulty. However, if the organism producing these infections is unknown, the recommended treatment consists of combinations of aureomycin or terramycin with dihydrostreptomycin. Aureomycin and terramycin are preferable to penicillin, since they have a wider antibacterial spectrum. In the treatment of meningitis it is well to remember that terramycin does not diffuse into the cerebrospinal fluid. The suggested dose is 3 gm. of aureomycin or terramycin daily combined with 2 gm. of dihydrostreptomycin. If treatment is to be given for more than two weeks, the daily dose of dihydrostreptomycin should be 1 gm. Further clinical trials are necessary before final statements can be made concerning the optimal dose and the combinations of choice.

Conclusions

The data concerning combined therapy are confusing and in some cases contradictory. Furthermore, in many instances the clinical significance of the laboratory data is yet to be established. However, a few facts of significance seem clear.

First, a definite synergism between penicillin and dihydrostreptomycin has been established. The reason for this synergism is still in question. One group of investigators feels that the residuum of viable bacteria left by penicillin is destroyed by dihydrostreptomycin, while another group is of the opinion that dihydrostreptomycin added to penicillin controls the development of resistant forms by inhibiting their ability to multiply. Another hypothesis explaining this synergism is based on the fact that combinations of these drugs substantially increase the bactericidal rate.

Second, there appears to be an antagonistic effect between penicillin and aureomycin or chloramphenicol. In other words, penicillin is more effective alone than in combination with either aureomycin or chloramphenicol. This is thought to be due to the fact that aureomycin and chloramphenicol are bacteriostatic, thus inhibiting the multiplication of the bacteria. This slows the action of penicillin, which is known to be most

COMBINATIONS OF ANTIBIOTICS—WELLMAN

effective against bacteria in the rapidly growing phase.

Third, certain bacteria made resistant to aureomycin, to terramycin and to chloramphenicol showed an increased resistance to all three of these antibiotics but not to dihydrostreptomycin. Bacteria made resistant to dihydrostreptomycin did not show an increased resistance to the other three antibiotics. These findings are consistent with the fact that combinations of aureomycin and dihydrostreptomycin are effective in the treatment of brucellosis. These facts suggest that combinations of aureomycin or terramycin with dihydrostreptomycin would be effective in the treatment of peritonitis, meningitis and bacteremia when the organism causing these infections is unknown.

Fourth, a combination of aureomycin and dihydrostreptomycin represents the treatment of choice in brucellosis.

Fifth, the recommended treatment in subacute bacterial endocarditis due to enterococci consists of a combination of penicillin and dihydrostreptomycin. This combination is also preferable when the etiologic agent is unknown.

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DDT INSECTICIDE SAFE IF WISELY USED

DDT, an essentially poisonous material, can be used with a wide margin of safety if it is wisely used, reports the Committee on Pesticides of the Council on Pharmacy and Chemistry of the American Medical Association in the current (March 10) *Journal of the AMA*.

DDT—in the form of powders, solutions, emulsions and aerosols—has been widely used in recent years to control plant and animal pests as well as disease-carrying insects with a great deal of success.

The committee, which recently reviewed literature and case reports on the substance, points out that the poisonous effect of DDT on living organisms decreases with

the increase in complexity of the organism. Thus insects, a lower type of organism, are destroyed by the substance while human beings and the higher types of animals are "not likely" to be harmed.

Some human deaths, however, have been caused by DDT and therefore "certain precautions must be observed to guard against its potential toxic properties," they added.

A warning was given to farmers to be careful when applying DDT to food or fodder crops. DDT applied directly to the edible portions of a plant may result in poisoning. It should not be used on dairy cattle or ani-

(Continued on Page 561)

THE EFFECT OF CORTISONE IN GLOMERULONEPHRITIS AND THE NEPHROPATHY OF DISSEMINATED LUPUS ERYTHEMATOSUS

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ON the basis of theoretical considerations and in view of some encouraging preliminary reports, it was considered advisable to study carefully the effects of cortisone on renal function in patients with various types of renal disease. The data presented in this report are derived from the investigation of four patients in various phases of glomerulonephritis and two patients with the nephropathy of disseminated lupus erythematosus.

Results

The first patient was a thirty-year-old man with acute glomerulonephritis. The values for the renal plasma flow, glomerular filtration rate, filtration fraction, hematuria, albuminuria, and blood urea nitrogen are recorded in Table I. The control observations demonstrate abnormalities characteristic of this disease and include a marked reduction of the glomerular filtration rate, prominent hematuria and albuminuria, and an elevation of the blood urea nitrogen. This patient was given cortisone acetate, 200 mg. daily, for twenty-three days. During the period of hormone administration there was an increase in the renal plasma flow and a delayed increase in the rate of glomerular filtration. The degree of hematuria, albuminuria, and azotemia was not altered. After cortisone was discontinued, the renal plasma flow and glomerular filtration returned to values below the control levels and the other measurements remained essentially unchanged. Five months after the completion of this study the patient died of severe renal insufficiency. At the time of the autopsy the kidneys showed the findings of subacute glomerulonephritis.

The second patient was a fifty-eight-year-old man who developed acute glomerulonephritis following an acute streptococcal pneumonia (Table II). At the time that the studies were initiated the patient was improving spontaneously. However, the control observations still revealed marked renal dysfunction, hematuria, albuminuria, and mild azotemia. This patient received 100 mg. cortisone daily for twenty-one days, and after a two-week period of observation, he was given a second course of cortisone, 200 mg. daily, for one week. During these studies there was a definite rise in both the renal plasma flow and the rate of glomerular filtration. Hematuria, albuminuria, and the blood urea nitrogen showed only minimal changes from the control levels. Six weeks after the second period of drug administration

TABLE I. CORTISONE IN ACUTE GLOMERULONEPHRITIS. PATIENT A.F.

	R.P.F.	G.F.	F.F.	Urine		Blood Urea Nitrogen (mg. %)
	ml. per min.		(%)	Red Cells	Albumin (gm./24 hr.)	
Control Week 1	511	44.4	11.5	4+	14.9	52.8
Treatment Week 1	563	35.3	6.3	4+	17.2	55.4
Week 2	612	31.2	5.2	4+	22.2	54.0
Week 3	603	40.7	7.2	4+	15.2	46.5
Week 4	651	48.2	7.4	4+	—	50.0
Post Treatment Week 1	363	38.5	10.6	4+	14.8	41.5
Week 2	423	32.5	7.6	4+	13.4	27.8

R.P.F.: renal plasma flow
G.F.: glomerular filtration rate
F.F.: filtration fraction
1+: 3 to 10 red blood cells per high power field
2+: 10 to 30 red blood cells per high power field
3+: 30 to 100 red blood cells per high power field
4+: more than 100 red blood cells per high power field

TABLE II. CORTISONE IN ACUTE GLOMERULONEPHRITIS. PATIENT M.K.

	R.P.F.	G.F.	F.F.	Urine		Blood Urea Nitrogen (mg. %)
	ml. per min.		(%)	Red Cells	Albumin (gm./24 hr.)	
Control Week 1	186	26.5	14.1	4+	0.65	27.5
Treatment Week 1	204	35.7	17.5	4+	0.79	26
Week 2	221	42.6	18.7	4+	0.37	23
Week 3	222	42.3	19.0	4+	0.53	22
Post Treatment Week 1	263	56.0	21.0	4+	0.41	23
Week 2	240	45.0	18.7	4+	0.57	22
Treatment Week 1	239	64.0	22.0	2+	0.30	22
Post Treatment Week 1	243	53.3	21.9	3+	0.57	23
Week 2	261	50.8	22.2	4+	0.30	22
Week 3	214	43.8	20.4	—	—	—

the routine urinalysis was negative except for a trace of albumin. The Addis count, however, still demonstrated hematuria and cylindruria.

The third patient (Table III) was a thirty-year-old man with subacute glomerulonephritis. The control observations in this patient revealed a normal renal plasma flow but a moderate reduction in the rate of glomerular filtration. There was moderate hematuria and moderately severe albuminuria. A slight elevation of the blood urea nitrogen was noted during the first week of control studies but this had returned to within normal limits prior to the use of cortisone. The patient was given 150 mg. cortisone daily for twenty-eight days. During the period of steroid administration the rate of glomerular filtration increased and approximated a nor-

Read at the annual meeting of the Minnesota State Medical Association, Rochester, Minnesota, April 30, 1951.

CORTISONE IN GLOMERULONEPHRITIS—JACOBSON ET AL

TABLE III. CORTISONE IN SUBACUTE GLOMERULONEPHRITIS. PATIENT L.L.

	R.P.F.	G.F.	F.F.	Urine		Blood Urea Nitrogen (mg. %)
	ml. per min.		(%)	Red Cells	Albumin (gm./24 hr.)	
Control	684	79.4	11.6	3+	7.4	22.5
Week 1	650	80.9	12.4	3+	5.5	16.4
Week 2						
Treatment	694	89.2	12.9	3+	8.7	18.5
Week 1	704	98.3	13.9	3+	7.9	20.7
Week 2	—	—	—	2+	7.1	18.5
Week 3	644	100.9	15.7	2+	6.5	16.0
Week 4						
Post Treatment	658	100.8	15.3	3+	4.6	16.7
Week 1	674	108.8	16.1	4+	6.4	15.0
Week 2	—	—	—	—	—	—
Week 3	597	75.3	12.6	—	—	—

TABLE IV. CORTISONE IN CHRONIC GLOMERULONEPHRITIS. PATIENT P.S.

	R.P.F.	G.F.	F.F.	Urine		Blood Urea Nitrogen (mg. %)
	ml. per min.		(%)	Red Cells	Albumin (gm./24 hr.)	
Control	344	63.0	18.4	3+	2.54	16
Week 1						
Treatment	318	53.0	16.7	4+	5.10	16
Week 1	439	63.0	14.8	4+	5.30	20
Week 2	394	57.0	14.4	4+	6.60	27
Week 3						
Post Treatment	446	73.0	16.3	4+	5.88	25
Week 1	394	61.0	15.5	4+	3.73	16
Week 2						
Treatment	384	68.0	17.5	3+	3.73	17
Week 1	419	64.0	15.3	—	—	—
Post Treatment	439	67.8	15.4	4+	8.10	23
Week 1	356	56.2	15.8	3+	5.29	17
Week 2	—	—	—	2+	3.70	13
Week 3						

mal value. This increase in filtration was maintained for two weeks after cessation of the hormone, but thereafter the rate returned to the control level. Hematuria, albuminuria, and the blood urea nitrogen were not significantly altered.

The fourth patient (Table IV) was a forty-one-year-old man with the nephrotic phase of chronic glomerulonephritis. Control observations revealed a reduction of both the renal plasma flow and the glomerular filtration rate. There was moderate hematuria and albuminuria, but no azotemia. He was given cortisone, 100 mg. daily, for twenty-one days. After a two-week interval he was given a second course of 200 mg. daily for nine days. There were minor elevations of the renal plasma flow but the glomerular filtration rate was not appreciably altered. Hematuria persisted and albuminuria actually increased. The blood urea nitrogen also rose during the period of hormone administration. In general all observations had returned to the control levels by the second or third week after discontinuance of the drug.

The fifth patient (Table V) was a twenty-eight-year-old woman with chronic disseminated lupus erythematosus. The control observations revealed a moderate reduction of the renal plasma flow but a proportionately

TABLE V. CORTISONE IN LUPUS ERYTHEMATOSUS. PATIENT D.O.

	R.P.F.	G.F.	F.F.	Urine		Blood Urea Nitrogen (mg. %)
	ml. per min.		(%)	Red Cells	Albumin (gm./24 hr.)	
Control	434	45.0	10.4	2+	0.59	23.7
Week 1	428	48.4	11.3	1+	0.45	20.0
Week 2						
Treatment	—	—	—	2+	0.73	18.7
Week 1	396	57.0	14.4	2+	0.60	19.3
Week 2	376	60.8	16.2	2+	1.10	19.5
Week 3	354	62.5	17.7	3+	2.50	17.7
Week 4						
Post Treatment	309	—	—	4+	4.45	13.3
Week 1	371	73.0	19.7	3+	4.25	13.5
Week 2	394	52.7	13.4	2+	3.53	16.5
Week 3						

TABLE VI. CORTISONE IN LUPUS ERYTHEMATOSUS. PATIENT R.J.

	R.P.F.	G.F.	F.F.	Urine		Blood Urea Nitrogen (mg. %)	Tm _{ph} mg./min.
	ml. per min.		(%)	Red Cells	Albumin (gm./24 hr.)		
Control	688	46.9	6.8	2+	9.0	43.5	67.5
Week 1	777	42.3	5.4	3+	9.5	53.0	
Week 2							
Treatment	—	—	—	3+	11.5	66.8	30.8
Week 1	—	—	—	3+	11.4	66.0	
Week 2	572	27.9	4.9	4+	12.7	77.5	
Week 3	584	30.7	5.3	4+	12.8	65.0	
Week 4							
Post Treatment	—	—	—	3+	—	—	48.0
Week 1	403	28.7	5.8	4+	15.3	57.5	
Week 2	—	—	—	4+	19.0	48.0	
Week 3							

Tm_{ph} = maximal tubular excretory capacity for para-aminohippurate.

greater reduction of the glomerular filtration rate. There was moderate hematuria and albuminuria and a slight elevation of the blood urea nitrogen. A total of 4.625 grams of cortisone was administered during a twenty-eight day period. The rate of glomerular filtration increased during the period of hormone administration but returned to the control level three weeks after the drug was discontinued. There was some increase in hematuria and a definite increase in albuminuria. There was a striking increase in the blood pressure during the third week of cortisone administration and a severe hypertension persisted for two weeks after the drug was stopped. At the time of hospital discharge the patient still had marked hematuria, albuminuria, and a persistent hypertension. Approximately three months later she was known to have expired in another hospital.

The sixth patient (Table VI) was a twenty-three-year-old man with subacute disseminated lupus erythematosus. The control observations revealed a normal renal plasma flow, a normal tubular excretory capacity for para-aminohippurate, but a marked reduction of the glomerular filtration rate. There was a moderate hematuria, severe albuminuria, and an elevated blood urea nitrogen. Cortisone was administered in a dose of 150 mg. a day for twenty-five days. Despite this there was a further decrease in the glomerular filtration rate and a fall in the renal plasma flow. As further evi-

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THE PRESENT STATUS OF BCG VACCINATION

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ON July 12, 1950, the Public Health Service, Federal Security Agency, licensed the Research Foundation and the University of Illinois for the manufacture, exportation, importation, and the sale of BCG vaccine. This vaccine is now available commercially. I believe that this means that many of us may be called upon soon for advice as to BCG vaccination. I believe that we must either accept or reject this procedure in the control of tuberculosis.

I would, therefore, like to briefly discuss the present status of this controversial subject.

In 1908 Calmette and Guérin announced that they had developed a strain of bovine tubercle bacilli which was avirulent for cattle. In 1920 they reported that this BCG culture was harmless to man. Since that time millions of persons have been vaccinated with this product. During the past ten years, especially since the end of World War II, the use of BCG has increased tremendously. This is especially true in the Scandinavian countries and other countries of Europe, South America, China, and Japan. The World Health Organization, WHO, has been a very strong booster for vaccination throughout the war-ridden countries. Concerning Japan, it should be mentioned that most of their vaccination has been done with the dried vaccine. Brigadier General Sams reports that 31 million persons have received BCG immunization up to May of 1949 as a result of a tuberculosis control program inaugurated by the Supreme Command of the Allied Powers.

The joint enterprise is a co-operative effort between UNICEF and the Scandinavian Voluntary organizations on an international scale primarily with the objective of assisting national health authorities in the execution of mass BCG vaccination campaigns, and in introducing BCG recognition as one of the tools in their long-range tuberculosis control program. The joint enterprise has vaccinated millions.

Here in the United States we have been very

slow in accepting this procedure. Our mortality and morbidity rates have been and are much lower than those of the other countries of the world. Our facilities for the diagnosis, care and treatment of the tuberculous are likewise better than those found throughout the world. Therefore, the necessity for mass vaccination in our country has not been present.

The fact that Dr. W. G. Workman, Chief, Laboratory of Biologic Control, National Institute of Health, has licensed BCG means, according to Dr. Robert Anderson, Chief, Division of Tuberculosis, U. S. Public Health Service, "that the vaccine produced by the licensed laboratory has been found safe by trial with animals, that it is free from contaminating substances, and that it will produce a satisfactory immediate reaction in animals and human beings when used within the prescribed time limit."

Endless controversies concerning the dangers and the effectiveness of BCG have been present in the United States for many years. The dangers of vaccination can now be considered nil. The effectiveness as an immunizing agent is still open for discussion. Failures of vaccination may be due to (1) quantitative conditions connected with the preparation of the vaccine, or (2) the lack of technique for differentiating between allergy and protective immunity. Dr. Rene J. Dubos states that it is almost certain that the immunity produced by the vaccine is the outcome of a limited but definite multiplication of the attenuated bacilli in the body of the animal undergoing immunization, chiefly in the regional lymph nodes. The degree of immunization probably reflects in a certain measure the extent of this multiplication. It is very likely, on the other hand, that the degree of multiplication depends in turn upon at least four independent factors, namely, (1) the number of living micro-organisms injected, (2) their physiological state, (3) level of attenuation (or virulence), (4) susceptibility of the immunized individual.

Another problem, not yet answered, is the length of protection. How often must we re-

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vaccinate? Dr. Tonderlung of Copenhagen states that immunity will last from four and one-half to five years. That is the usual time stated. But the studies have not been too well carried out. Many of these problems are now being studied in the several projects of the Public Health Service, including the duration of immunization, method of administration, effectiveness, and evaluation program. The U. S. Public Health Service at the present time has three studies in progress:

1. In 1947 they began vaccinating the Georgia school children. This study is still going on and will involve nearly 75,000 children.
2. The Indian study. This has now reached a total of 30,000.
3. The largest study project consists of a co-operation program launched last fall with the Department of Health of Puerto Rico. The entire school system is involved.

Much has been said as to the lack of controlled studies. I believe that Dr. R. R. Ferguson's studies in Canada have been well controlled. His study of nurses and employes in the general hospitals of Saskatchewan showed a decrease in the morbidity rate among the vaccinated in general hospitals 1 to 4 and in the Sanatorium group 1 to 5 of the incidence as compared with the previous five-year incidence before vaccination was inaugurated. His experience with the vaccination of the highly exposed Indians showed a decrease of 1 to 4 in the morbidity and mortality rates among the vaccinated as compared to the controls.

The Aronson and Palmer studies conducted among the American Indians are carefully controlled. The vaccination program began in 1936. An eleven-year follow-up shows 1,551 vaccinated, 1,457 controls. The morbidity rate was 27.8 in the controls and 11.1 in the vaccinated group. The tuberculosis mortality rate showed a difference favorable to the vaccinated of 0.4 and 3.5. There are many other studies that could be mentioned.

It might be of interest to look at the figures concerning the amount of BCG vaccine distributed here in our own country. We have three laboratories producing BCG vaccine. Dr. Joseph D. Aronson of the Henry Phipps Institute, Philadelphia, stated that with few exceptions the Institute does not provide BCG vaccine outside the State of Pennsylvania. It has, however, provided BCG vaccine to the United States Indian Service. From July 1, 1949, to January 28, 1950, 3,438 persons

have been vaccinated in the State of Pennsylvania with this vaccine. During the first half year of 1950 another 1,600 were added. Dr. Konrad Birkhaug of the Health Department, State of New York, stated that the Health Department cannot provide BCG vaccine outside the State of New York except for a few specified United States Public Health Service projects. It has provided the Philippine Islands with 2,000 doses of vaccine weekly for thirty-eight weeks and the Puerto Rico project with 10,000 doses weekly for twenty-four weeks. During 1948 and 1949, 6,596 vaccinations were performed in the State of New York. In a letter received from Dr. Birkhaug in September of 1950, he stated that during the first eight months of this year 1,450 individuals were vaccinated in New York and 1,390 of these became tuberculin positive, or 96 per cent. He ends his letter with, "My general impression is that BCG vaccination is increasing rapidly in New York and is being used extensively for nurses, medical students, hospital personnel, children's clinics (Harlem, New York City, Albany, Buffalo, Syracuse), and in mental hygiene institutions. But, even so, this is only a small fraction of the vaccine that we are sending out of this state which has already been inoculated into more than one million individuals during the past eight months." Dr. Sol Rosenthal of the Tice Laboratory, Chicago, Illinois, reported that during one year, 1949-1950, the Tice Laboratories have provided BCG vaccine to 103 institutions. These include seventeen medical schools and forty-four schools of nursing. The recipients were located in sixteen states, two territories, and the District of Columbia. In 1950 Tice Laboratories shipped 179,000 doses, and during the first three months of 1951 they equaled that figure.

Very little vaccination has been done in Minnesota. At Glen Lake Sanatorium we have vaccinated more than 350 persons. We have been vaccinating our negative tuberculin reacting prospective employes, student nurses in some of the hospitals in Minneapolis, namely, Eitel, Northwestern, Abbott, and a few at St. Mary's, St. Andrew's, St. Joseph, and St. Barnabas. We have also vaccinated children in homes where ex-patients would be sent who occasionally have a positive gastric culture. At Nopeming Sanatorium, just outside of Duluth, over 270 vaccinations have been done. A small amount of vaccination has been done at the Veterans Admin-

PRESENT STATUS OF BCG VACCINATION—FENGER

istration Hospital in Minneapolis, and here at the Mayo Clinic.

At the present time I believe we should follow the American Trudeau Association's recommendation, namely, vaccination of the following more vulnerable groups, provided they do not react to adequate tuberculin tests:

1. Doctors, medical students, and nurses who are exposed to tuberculosis.
2. All hospital and laboratory personnel whose work exposes them to contact with the bacillus of tuberculosis.
3. Individuals who are unavoidably exposed to infectious tuberculosis in the home.
4. Patients and employes in a mental hospital, prison, and other custodial institutions in whom the incidence of tuberculosis is known to be high.
5. Children and certain adults considered to have inferior resistance and living in communities

in which the tuberculous mortality rate is unusually high.

It is to be emphasized that BCG vaccination must not be regarded as a substitute for approved hygienic measures or for the public health practices designed to prevent or minimize the tuberculous infection and disease. Vaccination should be regarded as only one of the many procedures to be used in tuberculosis control program.

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THE EFFECT OF CORTISONE IN GLOMERULONEPHRITIS

(Continued from Page 542)

dence of the progressive renal dysfunction the Tm PAH decreased approximately 50 per cent. Hematuria, albuminuria, and azotemia increased. A severe hypertension also developed. During hormone administration there was a somewhat paradoxical rise in the serum potassium concentration and a fall in the serum sodium concentration. Six weeks after the completion of the studies the patient died of severe renal insufficiency and hyperpotassemia. Microscopic examination of the kidneys revealed lesions of subacute glomerulonephritis and the wire-loop capillaries of lupus erythematosus. There was diffuse glomerular involvement and marked tubular atrophy.

Discussion

Analysis of the data that has been presented reveals that transient improvement in renal function, as measured by the renal plasma flow and glomerular filtration rate, may occur during the administration of cortisone. Hematuria and albuminuria, however, did not decrease, and in some instances actually increased. It is apparent that some of the observed changes in renal hemodynamics are due to spontaneous fluctuations in the disease process, but others seem to be associated with the cortisone administration. The mechanism by which these transient increases in renal function may be caused by this hormone is un-

known. Two mechanisms which may be involved are as follows: (1) a direct effect of cortisone upon the glomerular capillary bed or the renal vasculature; (2) an indirect effect of cortisone mediated through an increased extra cellular fluid volume. It is extremely unlikely that this steroid has any primary effect upon the glomerular capillaries or the basic pathologic lesion. At least some of the observed changes are probably related to the alterations in the extracellular fluid volume.

Summary

Four patients in the various phases of glomerulonephritis and two patients with the nephropathy of disseminated lupus erythematosus were studied during cortisone administration. Although transient changes in the renal hemodynamics were observed, hematuria and albuminuria did not decrease and, in some instances, actually increased. Cortisone had no demonstrable beneficial effect upon the basic pathologic process in the glomerular capillaries. In both patients with lupus erythematosus, severe hypertension was produced.

INFANT MORTALITY IN MINNESOTA, 1950

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DATA concerning certain medical problems associated with births have been collected routinely for many years by various state health departments. Since January 1, 1950, when revised birth certificates and stillbirth certificates were first used in Minnesota, certain information

reductions in infant mortality. In addition to summarizing the available data, the limitations and deficiencies encountered will also be pointed out so that the need for accurate and complete information on the birth and stillbirth certificates will be understood by physicians. It is hoped

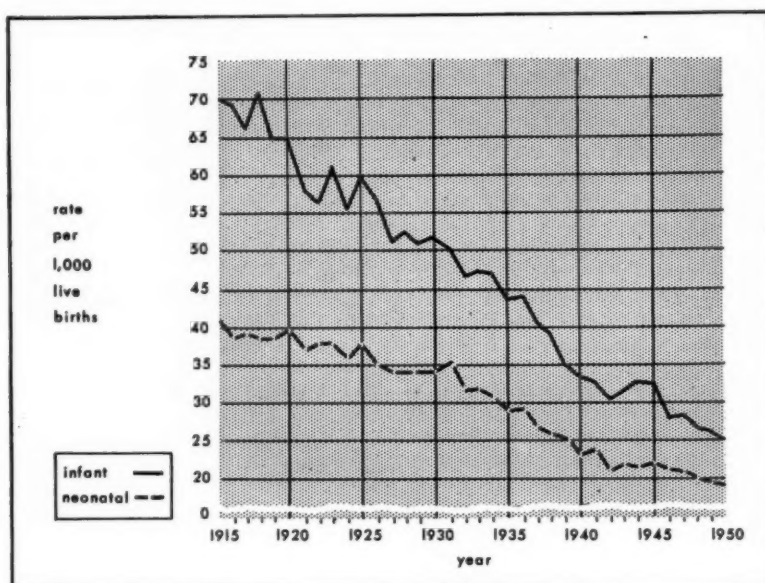


Fig. 1. Infant and neonatal death rates for Minnesota, 1915-1950.

relating to prematurity, congenital malformations, and weeks of gestation, as well as birth weight, has become available for statistical study.

The observations presented in the present article are based on limited and, in some cases, incomplete data and, of course, cannot serve as a substitute for detailed clinical studies. However, even limited information on a large number of births should be helpful in determining the size and extent of the problem and in developing public health programs, which may lead, with the co-operation of the medical profession, to further

that physicians will be gracious in furnishing diagnoses of congenital defects (which are not required on certificates) when such information is requested by the State Department of Health. The value of birth registration data in programs for reducing maternal and infant mortality will thus be considerably enhanced.

Infant Mortality

There has been a continuing decrease in Minnesota in infant mortality, which reached a rate of 25.0 per 1,000 live births in 1950, a decrease of 64 per cent since 1915, when the rate was 70.1 (Fig. 1). This decrease in deaths was accompanied by an increase in live births to 75,337 and

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a birth rate of 25.2 per 1,000 of population. Indians constitute about 0.5 per cent of the total state population (approximately 14,500). There were 599 Indian births and 26 infant deaths, with

The leading cause of death was immaturity (prematurity), which was responsible for 28 per cent of the deaths. This was a decrease of almost 10 per cent from 1949, when immaturity was re-

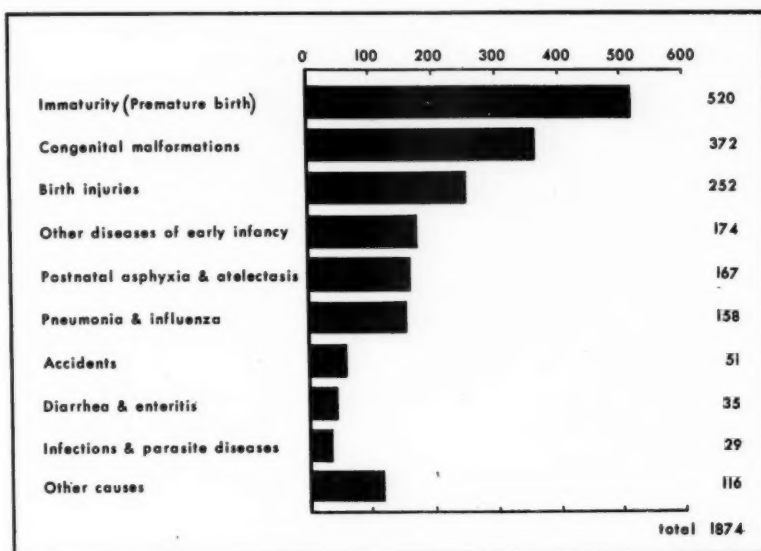


Fig. 2. Infant deaths by causes and number in Minnesota, 1950.

TABLE I. LIVE BIRTHS BY WEIGHT, COLOR, AND PLURALITY—MINNESOTA 1950 (PROVISIONAL)

Weight	Total		White		Non-white		Single		Multiple	
	No.	%	No.	%	No.	%	No.	%	No.	%
5 lb. 8 oz. or less (Immature)	4,401	5.8	4,294	5.8	107	8.4	3,616	4.9	578	38.9
5 lb. 9 oz. and over (Full term)	70,370	93.4	69,258	93.5	1,111	87.4	69,489	94.3	881	59.4
Not stated	568	0.8	513	0.7	55	4.2	543	0.74	25	1.7
Totals	75,339	100.0	74,065	100.0	1,273	100.0	73,648	100.0	1,484	100.0

a mortality rate of 43.4 per 1,000 live births. This rate was 67 per cent higher than the state rate but it was a reduction of 22 per cent from the 1949 rate. Provisional statistics show 1,874 deaths of infants under one year. More deaths occur during the first year of life than during any other one-year period. As a matter of fact, there are almost as many deaths in infancy as there are in all of the next thirty-nine years. It should be noted that 98.3 per cent of all births in Minnesota during 1950 occurred in hospitals, and 99.8 per cent were attended by physicians. There is, therefore, no problem of home deliveries or non-medical attendance.

Causes of infant deaths are shown in Figure 2.

sponsible for 37.4 per cent of infant deaths. In second place were congenital malformations, which accounted for 20 per cent, and in third place were birth injuries, accounting for 13 per cent of the mortality. Postnatal asphyxia and atelectasis were responsible for 9 per cent of deaths, pneumonia and influenza for 8 per cent, external causes for 3 per cent, and diarrhea and enteritis for less than 2 per cent. These figures showed slight variations from 1949.

Immaturity (Premature Birth)

Under the generally accepted statistical definition of immaturity (5.5 pounds or 2,500 grams or less), 5.8 per cent of all live births in Minnesota

INFANT MORTALITY—ROSENFIELD AND STOREY

in 1950 were immature (Table I). Non-white births constituted 1.7 per cent of all births, but 8.4 per cent of these births were immature. As would be expected, almost 40 per cent of multiple

54 per cent to a rate of 18.9 per 1,000 live births (Fig. 1). Almost 40 per cent of all infant deaths occurred on the first day of life, and another 29 per cent from one day to one week. Seventy-six

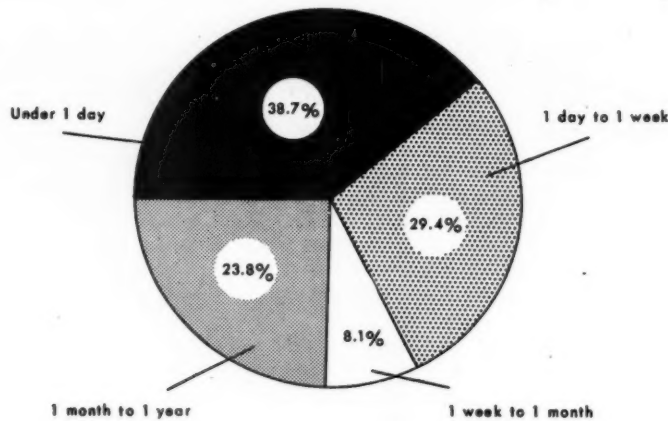


Fig. 3. Infant deaths by age period, Minnesota, 1950.

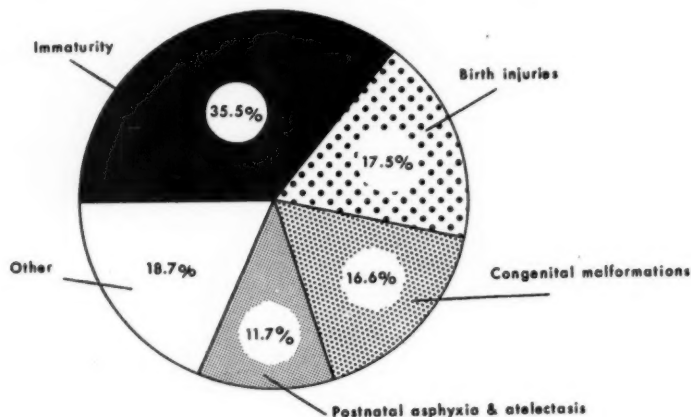


Fig. 4. Neonatal deaths by percentage, Minnesota, 1950.

births were immature in contrast to 5 per cent of single births. Only 0.8 per cent of all certificates of live births failed to record the birth weight, but five times as many certificates of non-white births omitted the weight. Almost 40 per cent of stillbirths were immature, but 25 per cent of the stillbirth certificates failed to show the birth weight (Table IV).

Neonatal Mortality (First 30 Days of Life)

While infant mortality has decreased 64 per cent since 1915, neonatal mortality has decreased

per cent of all the deaths occurred under one month, and only 24 per cent between one month and one year (Fig. 3). It is apparent that there has been greater success in reducing deaths in the age group from one month to one year than among those occurring during the first thirty days of life.

Immaturity was responsible for 35.5 per cent of all neonatal deaths and 93 per cent of these deaths occurred during the first week of life (Fig. 4). This was a decrease of 14 per cent from 1949, when immaturity accounted for 49 per cent

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TABLE II. POSTNATAL DEATHS BY CAUSE—
MINNESOTA, 1950 (PROVISIONAL)

	No. of Deaths	Per Cent
Diseases peculiar to first year of life:		
Congenital malformations	134	30.1
Birth injury	2	0.4
Immaturity	13	2.9
Other diseases	19	4.3
Pneumonia and influenza	116	26.1
Diarrhea and enteritis	31	7.0
External causes	36	8.1
Infective and parasitic diseases	20	4.5
Other causes	74	16.6
Totals	445	100.0

of the neonatal deaths. It is of interest to note that more than one-third (35.5 per cent) of neonatal deaths occurred among only 5.8 per cent of the live births (immature infants weighing 5.5 pounds or less), while 65 per cent of the neonatal deaths occurred among 94.2 per cent of the full-term live births (over 5.5 pounds in weight). Among the ten leading causes of death, prematurity is now in eighth place. Birth injuries and congenital malformations were each responsible for 17 per cent of the deaths, as in 1949. Congenital malformations are now in ninth place among the ten leading causes of death. Postnatal asphyxia and atelectasis caused 12 per cent of the deaths. Deaths from pneumonia (2.9 per cent) and external causes (1.1 per cent) occurred at the same rate in the previous year, but diarrhea of newborn occurred in only four infants (0.3 per cent).

Postnatal Mortality (1 month to 1 year)

The chief cause of death in this group (Table II) was congenital malformations, which were responsible for 30 per cent of the deaths during this period. This total is an 18 per cent increase over 1949 but is probably due to more frequent autopsies and more accurate diagnoses rather than to a real increase in mortality. Pneumonia and influenza, in second place, were responsible for 26 per cent of the deaths, a decrease of 16 per cent over the 1949 deaths, which amounted to 31 per cent of the total. In third place were deaths from external causes, which decreased from 11 per cent to 8 per cent. Diarrhea and enteritis deaths decreased from 10.8 per cent in 1949 to 7 per cent in 1950.

Congenital Malformations

A tabulation of certificates of live births (Table III) shows that, of 4,401 immature births, 2.5 per cent indicated congenital defects. The ques-

TABLE III. CONGENITAL MALFORMATIONS IN
LIVE BIRTHS BY WEIGHT—MINNESOTA, 1950
(PROVISIONAL)

Weight in Pounds	Total Live Births	Congenital Malformations			
		Yes	%	No	Not Stated
Less than 1	25	—	—	22	3
1	212	6	2.8	187	19
2	300	7	2.3	272	21
3	561	25	4.5	497	39
4	1,363	36	2.8	1,252	75
5 lb. 8 oz.	1,940	34	1.7	1,784	122
Total Immature (Premature)	4,401	108	2.5	4,014	279
5 lb. 9 oz.—5 lb. 15 oz.	2,706	44	1.6	2,533	129
6 lb.	16,319	158	1.0	15,262	899
7	26,333	198	0.6	24,724	1,411
8	17,884	127	0.7	16,651	1,106
9	5,686	29	0.5	5,290	367
10 and over	1,442	10	0.7	1,344	88
Not stated	568	17	2.9	323	228
Totals	75,339	691	1.0	70,141	4,507

TABLE IV. STILLBIRTHS BY WEIGHT AND CON-
GENITAL MALFORMATIONS—MI
1950
(PROVISIONAL)

Weight	Total		Congenital Malformations		
	No.	%	Yes	No	Not Stated
5 lb. 8 oz. or less (Immature)	489	39.5	80	325	84
5 lb. 9 oz. and over (Full term)	440	35.6	57	324	59
Not Stated	308	24.9	35	131	142
Totals	1,237	100.0	172	780	285

tion was not answered on 6.3 per cent of the certificates. Among full-term newborns (more than 5.5 pounds) 0.97 per cent indicated congenital defects. On 6.0 per cent the question was not answered. Such defects, therefore, were noted two and a half times as often in immature infants as in full-term live-born infants.

Stillbirths certificates recorded congenital defects in 17 per cent, of which immature stillbirths totalled 20 per cent while full-term stillbirths totalled 15 per cent, but 15 per cent of the certificates in this group failed to answer the question. Of the total of 1,237 stillbirth certificates, 23 per cent failed to answer the question.

Since birth certificates require only "yes" or "no" to the question of congenital malformations, diagnoses are not available on live-birth certificates. It is, therefore, planned to query physicians for specific diagnoses in an effort to determine the frequency of occurrence of various defects and their ultimate outcome. Minor anomalies are infrequently noted on birth or death certificates. In addition, a significant number of infants who are believed to be normal at birth

INFANT MORTALITY—ROSENFIELD AND STOREY

TABLE V. INFANT DEATHS DUE TO CONGENITAL MALFORMATIONS—MINNESOTA, 1950 (PROVISIONAL)

	Under One Year	Under One Month	One Month to One Year
Total	372	238	134
Monstrosity	34	33	1
Congenital malformations of nervous system	103	55	48
Spina bifida and meningocele	50	28	22
Congenital hydrocephalus	45	23	22
Other	8	4	4
Congenital malformations of circulatory system	144	84	60
Tetralogy of Fallot	5	4	1
Patent ductus arteriosus (Bottali)	11	7	4
Interventricular septal defect	13	2	11
Interatrial septal defect	10	5	5
Coarctation of aorta	6	5	1
Other and unspecified malformations	99	61	38
Cleft palate and harelip	3	0	3
Congenital malformations of digestive system	40	26	14
Congenital hypertrophic pyloric stenosis	5	0	5
Imperforate anus	1	1	0
Other	34	25	9
Congenital malformations of genito-urinary system	12	9	3
Polycystic disease of kidney	7	6	1
Other	5	3	2
Congenital malformations of bone and joint	9	6	3
Chondrodysplasia	1	1	0
Congenital malformation of skull	6	4	2
Other	2	1	1
Other and unspecified not elsewhere classified	27	25	2

are found later in life to suffer from hidden anomalies.

Specific causes of infant deaths due to congenital malformations are tabulated in Table V. Of the total of 372 such deaths, 238 (64 per cent) occurred during the neonatal period and 134 (36 per cent) died from one month to one year. Slightly more than 80 per cent of all deaths due to congenital malformations occurred within the first year of life. During the first month (neonatal period) congenital defects of the circulatory system accounted for 36 per cent of the deaths, defects of the central nervous system for 23 per cent, monstrosities for 14 per cent, and defects of the digestive system for 12 per cent. It has already been stated that congenital malformations are responsible for one-sixth of all neonatal deaths (16.6 per cent) and for 20 per cent of infant deaths.

During the postnatal period (one month to one year) congenital malformations were responsible for 30 per cent of the deaths. Defects of the circulatory system were responsible for 46 per cent of deaths, defects of the nervous system for 35 per cent, and defects of the digestive system for 11 per cent.

The mortality rate among infants in the postnatal period is less than one-third that among infants under one month of age. Therefore, any

sizable reduction in total infant mortality must be achieved during the neonatal period and possibly among stillbirths. The chief causes of death during this period are immaturity, birth injuries, and congenital malformations, which together are responsible for 70 per cent of all the deaths.

Many of the early births are due to obstetric complications which must, at present, be considered as unpreventable. In many instances, pregnancy probably could have been carried safely to a period of decreased risk to the infant by better prenatal care, adequate nutrition, and good clinical judgment and techniques in obstetrics. If the pregnancy does terminate in a premature birth, more adequate facilities and better trained medical and nursing personnel to treat prematures are necessary. A number of states have established centers to which premature infants are transported for special care. This problem involves medical care and is of a type that is not engaged in by the Minnesota Department of Health. Since the greatest mortality occurs on the first day of life, it is not considered advisable here to transport premature infants to such centers. It is felt that prematures can be handled locally by providing more adequate facilities in rural hospitals and by assisting in developing better equipped nurseries and better trained medical and nursing personnel in larger regional hospitals.

While many birth injuries are unavoidable, it is hardly necessary to point out that the type of anesthesia and analgesia, induction of labor and the clinical judgment and techniques used in operative procedures play an important part in events that may affect the newborn.

In the past, little attention has been given to congenital malformations, because inherited defective germ plasm cannot be controlled. In recent years it has been recognized that congenital anomalies may be acquired during pregnancy as a result of maternal disease, and certain environmental factors which can be controlled have been studied. For instance, Ebbs, Tompkins, and others have demonstrated that a proper diet, with adequate protein, vitamins, and minerals, decreases the number of stillbirths, toxemias, prematures, and congenital malformations. Experimental work by Warken, Ingalls and others has demonstrated the effects of diet in malformations

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MINNESOTA MEDICINE

EMERGENCY BLOOD TRANSFUSION

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THE present state of world affairs demands a constant awareness of the possible sudden need for supportive treatment for large groups of people.

It is not within the province of this paper to weigh the pros and cons in the controversy over the need of a massive blood-grouping program; neither is it my intention to discuss the requirements for an adequate local civil-defense program for the maintenance of an emergency supply of blood.

Rather, I wish to emphasize a few salient points in respect to a situation in which an emergency transfusion of blood might be needed.

The two most important and inclusive reasons for transfusion of blood are: (1) to increase the total circulating blood volume, and (2) to increase the oxygen-carrying power of the blood.

Either of these indications is, or both are, applicable to routine medical patients as well as to surgical or other patients who need supportive therapy to prevent the onset of shock or to treat a patient already suffering from shock.

True, there are other indications for the use of blood transfusion therapy, but in view of the fact that the subject is "emergency blood transfusion," the foregoing two indications probably cover the indications for emergency transfusion adequately.

Clinical Diagnosis Leading to Emergency Transfusion

Depletion of the blood volume by the loss of whole blood, plasma or water is encountered under many circumstances.

Many medical conditions tend to produce such a depletion of blood volume; gastrointestinal hemorrhage and chronic ulcerative colitis come readily to mind. Severe trauma, surgical operations, extensive burns and many other conditions may tend to produce shock accompanied by a loss of blood volume.

Much knowledge has been gained concerning

specific points of importance, such as how much loss of blood may be anticipated under certain operative procedures; how satisfactorily will the compensatory circulating mechanisms function under certain traumatic circumstances; how well will a patient withstand a debilitating disease without supportive treatment?

Properly to evaluate the patient's condition, whether it be a sudden surgical or traumatic emergency, or whether a medical patient has suddenly demonstrated the clinical picture of shock, three questions must be considered:

First, is the total blood volume decreased?

Second, what is lost—whole blood, plasma or water?

Third, what and how much is needed to restore the patient to a good physical condition?

Determination of loss of blood volume is not readily done without some equipment and the expenditure of time. The specific gravity of the blood may be estimated, dye may be administered intravenously and the resultant dilution determined, sponges may be weighed before and after operation, and so on. However, it would appear that critical evaluation based largely on observation must be depended on to a large degree.

Decision as to whether whole blood, plasma or water is the component lost is of real importance in selection of the type of therapy needed. Knowledge of the medical disease present or of the physical condition of the patient suffering from trauma or surgical intervention is helpful in arriving at a decision.

Shock due to simple loss of water occurs only in extreme alterations of fluid balance. This loss of water must be at least 6 per cent of the body weight before clinical signs of dehydration will be apparent. Even at this point, there is no real marked loss of blood volume, unless loss of water becomes so rapid that the ordinary compensatory mechanisms protecting the plasma volume are functioning inadequately. In this instance, hypotension and marked hemoconcentration may appear.

For evaluation of the loss of plasma volume a hematocrit determination may be suitable. Usual-

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ly, an elevation of 1 above the normal per cent of 45 is accepted as corresponding to the loss of 100 c.c. of plasma. A loss of blood volume of approximately 35 per cent, which corresponds to a hematocrit reading of 60 to 65, usually results in low blood pressure. These observations do not necessarily obtain in the presence of burns after secondary anemia has made its appearance.

When whole blood is lost, the hematocrit determination is of relatively little value so far as estimation of the total loss of blood is concerned. Although different observers have varying opinions, the view in general seems to be that a blood pressure of less than 85 mm. of mercury is indicative of a 25 per cent loss of blood volume (1,500 c.c. in an average man). If vasoconstriction is marked and perhaps has been stimulated by the administration of vasopressor drugs, these clinical observations may be inaccurate.

Treatment

After the decision has been made as to the amount of blood volume lost and the particular component lost, and an idea has been formed as to what volume of therapeutic agent is warranted, treatment must be instituted. In view of the present knowledge of replacement therapy, it soon becomes evident that treatment for the most part will comprise the transfusion of whole blood or plasma and/or certain other solutions, such as saline, glucose, gelatin, dextran or other available agents.

The emergency nature of the situation and the occasional hampering effects of the site at which the emergency occurs must necessarily modify some of the more desirable details of the carrying out of any supportive therapy procedure.

Adjunct forms of therapy, such as the application of heat, placing of the patient in the shock position, administration of oxygen and so on will not be considered herein.

Restoration of Blood Volume.—Restoration of the reduced blood volume is the single, most important item in the treatment of traumatic and hemorrhagic shock. All other treatments are considered adjuncts. Restoration of blood volume must be considered from several points of view:

First, the type of fluid replacement available.

Second, the amount of fluid necessary satisfactorily to treat the patient.

Third, the response of the patient.

Fourth, the occurrence of any untoward reactions.

In most instances of clinical shock, the use of crystalloid solutions plays a secondary role; whole citrated blood or plasma is necessary to restore a normal circulation.

The general consensus now is that whole blood is the fluid of choice for restoration of blood volume. It is doubly valuable in view of the fact that after the treatment of shock with other fluids, anemia sometimes may be observed. Whole blood will ameliorate this situation. Yet there are situations in which whole blood may not be immediately and readily available; when this is true, other fluids necessarily will be used.

Insofar as possible, blood grouping and Rh typing should be carried out for recipients prior to the administration of blood. Similarly, if it is at all possible, cross-matching of the donor's blood cells and serum should be carried out with the recipient's serum and cells.

It is advisable to use the corresponding blood grouping and Rh typing of the donor and recipient; that is, blood group for blood group and Rh typing for Rh typing. In emergencies, a different situation arises; it is not always possible to determine the recipient's blood group and Rh type, and in such instances it is advisable to use group O blood from an Rh-negative donor.

Patient With Group O Blood as a Universal Donor.—At the Mayo Clinic it is the practice to determine the anti-A agglutinin titer of all group O donors. It has been noted that approximately 50 per cent of all persons whose blood belongs to group O have an anti-A agglutinin titer of 1:64 or less, the Mayo Clinic technique being used as the method of determination. It is our practice to administer group O donor blood which has an anti-A titer of more than 1:64 only to recipients whose blood type is group O.

Mathieson has observed that if group O donor blood recently has been administered to a recipient, it occasionally is difficult to determine conclusively the blood group of that patient if his blood is not in group O. This points up the advisability of determining the blood groups of prospective recipients before group O is administered. It follows, then, that when a blood grouping determination is requested and the patient concerned has received blood within a month, this

EMERGENCY BLOOD TRANSFUSION—SELDON

information should be communicated to the laboratory.

Rh Typing.—It is the general consensus that corresponding Rh typing of the blood of the donor and that of the recipient should be the rule.

Insofar as possible, Rh-positive blood should be administered to patients with Rh-positive blood. It is known that certain patients with Rh-negative blood have been sensitized to the Rh factor by their having received Rh-positive blood by transfusion. Because of this possibility, whenever it is possible Rh-negative blood should be administered to patients who have Rh-negative blood.

When plasma has been lost, and the patient requires an emergency transfusion, the choice of fluid to be transfused should be obvious. Under such circumstances, human serum albumin does not seem to have any advantage over plasma.

Frozen, dried or liquid plasma seems to be equally valuable. In the special field of severe burns there is general agreement that plasma should be used initially and later followed by whole blood, as indicated.

Amount of Fluid Necessary for Replacement.—Many observers have advocated the use of formulas based on the hematocrit reading, on the erythrocyte count, on the value for hemoglobin, or on the specific gravity of the blood or plasma to determine the amount of blood or plasma necessary to be administered. These aids frequently are not readily available or are not practical. I believe that much emphasis should be placed on the clinical observations and the course of the treatment which is based upon these observations.

Circulatory failure which requires support in the form of emergency transfusion of blood may appear any time after severe trauma, or in medical emergencies during anesthesia or operative procedures, or postoperatively. In all instances it is imperative to give adequate supportive therapy. In circulatory failure the amount of fluid administered varies, as must the speed of administration. It may be that several hundreds of cubic centimeters of the right type of fluid may be administered rapidly enough to get 1,000

c.c. into the circulation quickly. Clinical judgment is very important in this respect.

Evaluation of the Response to Treatment

The whole purpose of the emergency transfusion of blood is to return the patient's physiologic and biochemical processes to as nearly normal as possible.

A good response is the return of the blood pressure to a reasonably normal level, followed by a slowing of the pulse rate and an increase in the total circulating blood volume. A lessening of the peripheral vasoconstriction and a return to normal of the cardiac output are important. There also should be a return to normal of certain biochemical criteria.

From a clinical standpoint, a warming of the skin, increased output of urine, improved pulse rate and increasing alertness of the patient are important.

Frequently, a poor response may be due to inadequate restoration of blood volume, continued bleeding and the like. If such poor responses persist, the emergency transfusion perhaps should be continued and operative interference considered if it is indicated. On the other hand, massive pulmonary edema may occur in late traumatic or postoperative periods and may be a cause of failure in the response to transfusion. If massive pulmonary edema occurs, a greater load of fluid such as would result from venous transfusion might unduly embarrass the patient. In such a situation arterial transfusion might be considered.

Conclusion

In these times of world unrest, no one is unaware of the potential needs for rapid and adequate supportive therapy. What is more imminent or actually present every day, however, is the mounting rate of accidents on the road, local civil disasters and other reasons for emergency transfusion. In addition to these, hospitals and physicians and surgeons every day are confronted with situations in which immediate supportive therapy is required. For these reasons and others, it is eminently desirable for all physicians to be aware of the fundamental principles of the important subject of emergency transfusion.

COIN LESIONS OF THE LUNG

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THE diagnosis of a solitary parenchymal nodular lesion of the lung has gained considerable importance in recent years by virtue of two stimulating factors. First, the routine chest x-ray examination of large sections of the population, and second, the marked advancements in thoracic surgery. For the past several years routine examinations of the chest have not only been done in large mass surveys, but have also become a routine part of hospital admissions as well as a part of the physician's routine physical examination. Were it not for the x-ray examination, most of the coin lesions would probably remain undiscovered. However, were it not for the possibility of surgical approach to these lesions, the importance of their discovery would obviously be minimized, if not altogether unimportant.

This study was undertaken largely in an attempt to determine whether or not any criteria could be established by which a differential diagnosis could be made prior to removal of the mass. Only those sharply circumscribed lesions of the lung which are globular in form and which are completely surrounded by lung tissue have been included in this study. All lesions related to the hilar area or those which superimpose themselves upon the hilum by virtue of their position near the midline have been omitted, as well as all lesions exhibiting fluid levels to indicate cyst or abscess formations. The term "coin lesion" has been used to denote a solitary lung nodule completely surrounded by lung tissue, and measuring 6 cm. or less in diameter. It is of course obvious that the term "coin lesion" is a misnomer, since the lesions are spheroid rather than disc-shaped. Nevertheless, the term is quite descriptive of the appearance of the lesion on the posteroanterior projections of the thorax upon the x-ray film (Fig. 1).

The discussion in the literature on this subject

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includes hilar lesions or those which are superimposed upon the hilum, and almost invariably includes lesions measuring up to 15 cm. in diameter. These lesions, it is felt, present a problem different from that of the coin lesion.

In this study an attempt was made to find a way to differentiate the malignant from the benign nodules. Of particular importance in this respect is the presence or absence of calcification within the lesions.

For the past few years we have attempted to discover a coin lesion containing demonstrable calcification, and which proved to be a primary malignant tumor. No such lesion has been observed in our experience. Thirty cases presenting coin lesions have been reviewed. In ten (33.3 per cent) calcium was demonstrable within the nodule, and not one of these proved to be malignant. Of the remaining twenty in which no calcium was demonstrable, ten (50 per cent) were malignant. This would therefore indicate that the presence of calcification is diagnostic of the benignancy of the lesion, while in the absence of calcium, there is a 50 per cent chance that the lesion is malignant. In the latter group, a diagnosis could not be made by any method short of resection and histological examination.

The presence of calcium within the coin lesion is frequently not readily apparent. Often special techniques are necessary before one can make this determination. Planigraphy has proved especially helpful in this situation (Fig. 2). When such apparatus is not available, a spot Bucky film may be useful. Although it is not within the scope of this paper to discuss indications or contraindications for operation, it is felt that the coin lesions with calcification need not necessarily be submitted to surgery.

On the other hand, those lesions without calcifications may be benign (Fig. 3) or malignant (Fig. 4). To recommend a period of observation may be misleading, since malignant lung nodules have been known to remain stationary for several years and thus lead the observer into a false sense of security, or may prove disastrous by becoming rapidly larger and possibly non-resectable (Figs. 5 and 6). In this group it is felt

COIN LESIONS OF THE LUNG—FINK

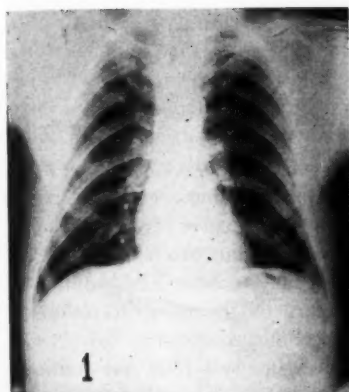


Fig. 1. Classical coin lesion in left lower lobe.



Fig. 2. Planigram of same case as Figure 1, clearly demonstrating stippled calcification within the coin lesion, and therefore benign.



Fig. 3. A noncalcified coin lesion which proved to be a tuberculoma when resected.

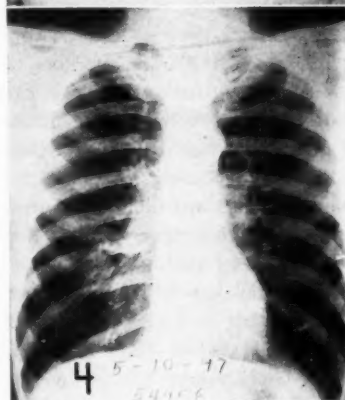


Fig. 4. A noncalcified coin lesion which proved to be carcinoma when resected.

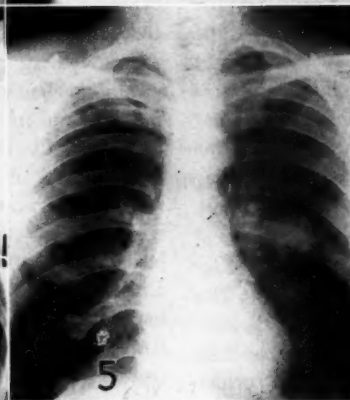


Fig. 5. A coin lesion without calcification discovered in a mass survey. Observation advised.

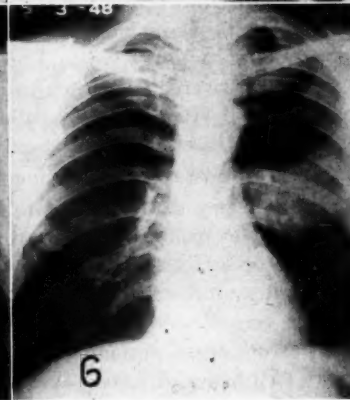


Fig. 6. Same lesion ten months later, showing marked enlargement, and spread to hilar area.

that resection of the lesion at the earliest possible time after its discovery is the procedure of choice.

Summary

A coin lesion is defined as a solitary pulmonary nodule completely surrounded by lung tissue and measuring 6 cm. or less in diameter. Thirty such lesions were reviewed. All those containing cal-

cium were benign, while 50 per cent of those without calcification were malignant.

It is felt that the calcified lesion should be treated conservatively.

Exploration and resection of the noncalcified lesion is recommended at the earliest possible time after its discovery.

Tuberculosis has so far been habitually considered to be a manifestation of social misery, and it has been hoped that an improvement in the latter would reduce the disease. Measures specifically directed against tuberculosis are not known to preventive medicine. But in future the fight against this terrible plague of mankind will deal no longer with an undetermined something,

but with a tangible parasite, whose living conditions are for the most part known and can be investigated further.

—DR. ROBERT KOCH, a translation by Berna Pinner and Max Pinner according to a paper read before the Physiological Society in Berlin, March 24, 1882, and from the *Berliner klinische Wochenschrift*, 1882.

THE MANAGEMENT OF VASOMOTOR RHINITIS

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NO entirely satisfactory form of therapy exists for vasomotor rhinitis. The literature is full of many types of treatment, none of which is effective in all cases. It seems increasingly evident from the recent literature that many authors are of the opinion that specific extrinsic allergy is a less common cause of vasomotor rhinitis than is intrinsic allergy. It is certainly true that in a large proportion of patients with vasomotor rhinitis the results of skin tests are all negative, and no specific allergy can be discovered. Recent articles emphasize endocrine dysfunction, sympathetic-parasympathetic imbalance and psychosomatic factors as frequent causes of vasomotor rhinitis.

The diagnosis of vasomotor rhinitis may frequently be made from the history. The typical story is of attacks of nasal congestion, sneezing and watery or mucoid nasal discharge. The patient may observe certain aggravating factors, such as cosmetics, certain foods, animals, and so forth. However, it is very common for a patient to have no idea what brings on an attack. An occasional patient with vasomotor rhinitis will mention nervous tension as an aggravating factor, but probably the majority have no idea what initiates their attacks. There are also those who have the symptoms all the time. This is particularly true of the symptom of nasal congestion. The coexistence of vasomotor rhinitis and asthma or asthmatic bronchitis is very common, and many of these patients also have nasal polyposis. An interesting triad of symptoms—asthma, nasal polyposis and allergy to aspirin—has been frequently observed here.

On examination, the nose may be entirely normal if the patient is seen in a period of remission. In such cases the history is most important in making the diagnosis. If the nose is seen during a symptomatic period, the mucosa is usually pale and the turbinates are swollen and boggy in appearance. The tissues appear wet, and clear mucus may be present. Polypoid changes

are often seen in varying degree, usually in the middle meatus. Roentgenologic examination of the paranasal sinuses frequently reveals thickened or edematous membrane, but often no pathologic change is seen on the films. The finding of eosinophils in smears of the nasal secretions is helpful in making the diagnosis, but is not essential. My colleagues and I do not routinely examine smears for eosinophils. Cutaneous tests for sensitivity to extrinsic allergens can be considered fairly reliable for the inhalants, but in our experience skin tests for foods are not reliable, and in adults are almost disregarded. At the Mayo Clinic a minimal number of skin tests are done. In the average case of vasomotor rhinitis, intracutaneous tests are done for mixed ragweed, timothy, orris root, horse hair, dog hair, cat hair, cattle hair, rabbit hair, mixed feathers, house dust, kapok, pyrethrum, and goat hair; and scratch tests are done for cottonseed, flaxseed and karaya. Tests for food are done usually in children and young adults by the scratch method. If a patient gives a definite history of seasonal hay fever, the tests for the pollens are done by scratch rather than intracutaneously.

There are many factors to be considered in the treatment of vasomotor rhinitis,⁵ and certainly no one form of therapy is effective in all cases. One of the first and most important steps is to instruct the patient to avoid all intranasal medication. We are all familiar with the chronic nasal congestion produced by habitual use of vasoconstricting nose drops.² There are many patients with rhinitis medicamentosa,⁴ in whom the nose will revert to normal after nasal medication is stopped. The use of intranasal medications containing the sulfonamide drugs or antibiotics is particularly to be condemned. The incidence of allergic reactions to these drugs is very high when used intranasally. Their use should be restricted to the treatment of infections.

If specific allergens are discovered on skin testing, or if the patient gives a definite history of increase in symptoms when exposed to certain substances, he should be instructed to avoid these substances if at all possible. Unfortunately,

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avoidance of extrinsic allergens is not always possible. This applies to such allergens as house dust or to substances with which a patient is in contact in his occupation. Most patients in whom no specific allergen is discovered, or in those sensitive to house dust, will derive benefit from the so-called dust-free bedroom.¹ Instruction in the preparation of such a room is given to these patients on the theory that about one-third of a person's life is spent in the bedroom. Dust-elimination measures consist of the application of dust-proof covers to mattresses and pillows; elimination of upholstered furniture and drapes which accumulate dust; the use of washable scatter rugs without rug pads; careful dusting of floors and furniture, preferably by someone other than the patient; and an air filter in the window. The air filter consists of an electric blower which forces air into the room through layers of cheesecloth mounted in a wooden frame in the open window. It is felt that this device should be used only in the summer. These patients do better sleeping in a warm room with the windows closed in the winter time. If the patient can afford it, an air-conditioning unit in the bedroom will be even more satisfactory than an air filter. In houses heated by circulating hot air it will be helpful to cover the air inlet in the bedroom with a cloth filter. All plants, flowers and household pets should be removed everywhere in the house. It should be remembered also that rug pads are made of cattle hair and their removal is advised if the patient has an allergy to this substance.

In regard to specific desensitization the greatest success is obtained in patients with pollen allergy or seasonal hay fever. It is not within the scope of this paper to discuss the details of hay fever therapy, and no attempt will be made to do so. It is our experience that other specific desensitization has not been very successful. Many authors have advised desensitization to dust in all cases of vasomotor rhinitis. Hansel and Shambaugh are among the leading advocates of this therapy. We feel that precautions against exposure to dust are more effective.

The antihistamine drugs are another addition to our armamentarium, but certainly do not offer complete or even partial relief to many patients. These drugs have become so numerous that to discuss them all would be impossible. A trial of antihistamine therapy is certainly worthwhile

in all cases of vasomotor rhinitis. Those patients who derive benefit from them usually notice the improvement almost immediately. A long trial of antihistamine therapy without symptomatic improvement is of very little value. Patients vary greatly in the number of side reactions to these drugs. If a person receives symptomatic relief from the antihistamine but has a side reaction, such as drowsiness, a trial of several of the drugs is indicated to determine which one can be taken with the least side effect. The symptom of drowsiness is perhaps an advantage if the drug is taken at bedtime. It is to be remembered that the antihistamine drugs are not curative but offer only symptomatic relief.

It appears to be an accepted theory that there is a psychosomatic element in a large number of cases of vasomotor rhinitis. Nervous tension or neurosis of various types certainly plays a part in aggravating the symptoms in many patients. If other forms of therapy fail, a discussion of the functional aspects of the disease will be of help, at least in those patients who have some insight into their problems.

Nasal polyposis is probably the most common nasal complication of vasomotor rhinitis. The severity of polyposis is extremely variable. There may be a single small polyp in the middle meatus, or the nose may be completely filled with polyps. In the milder cases, it is not unusual to see the nasal mucosa revert to a state approaching normal under medical management. However, in the more severe cases with complete or partial obstruction, surgical removal is the best form of therapy. Recurrence of polyps after removal is so common that it is worth while to consider what type of operation offers the best hope for a permanently open nose. Certainly a major surgical operation is not to be considered if only one or two polyps are present which can be easily snared off in the office. The problem arises in those cases in which there are multiple polyps. Many of these patients have had numerous polypectomies and recurrences. It is felt that such patients are best operated on in the hospital under adequate local anesthesia. Most polyps are seen to arise in the middle meatus and appear to grow out of the ethmoid cells. They occur frequently also in the spheno-ethmoid recess, originating in the posterior ethmoids and sphenoid. In these patients thorough removal of all polyps in combination with intranasal

ethmoidectomy, preserving the middle turbinate if possible, offers the best hope for a successful result. If polyps are present in the sphenoid recess, exenteration of the posterior ethmoids and opening the sphenoid should also be done. If nasal septal deflection is present to such a degree that access to the ethmoid area is difficult, a submucous resection adds greatly to the ease of the operation and requires very little more time.

It has been the practice at the Mayo Clinic for a number of years to use radium in combination with surgical treatment in many cases of multiple nasal polyps, especially those which have recurred several times. A 50 mg. tube of radium filtered with 1.0 mm. of platinum is placed in each ethmoid area and held in place with petrolatum (vaseline) gauze packing for three hours post-operatively. It is most difficult to draw any statistical conclusions from reviewing histories of patients treated with radium, but it is our impression that radium therapy is of some benefit in preventing recurrence. It is also our feeling that thorough surgical removal is even more important. Suppurative sinusitis may exist in patients with nasal polyposis, owing to blocking of the ostia of the sinuses. Here again careful but thorough removal of the polyps, with ethmoidectomy and the making of antrum windows, offers the best hope of cure.

Recently cortisone and ACTH have been tried in a few patients with nasal polyposis. The results have been encouraging in some, but in others no change in the polyps has been noted.

It is too early to evaluate the results. It is possible that after cessation of therapy there will be a recurrence of the polyps.

Summary

There is no specific cure for vasomotor rhinitis. The medical treatment consists in avoiding offending allergens if they can be identified. All intranasal medication should be stopped. Desensitization offers the best hope in cases of seasonal hay fever. Its results in perennial vasomotor rhinitis have not been encouraging. Measures to reduce exposure to dust, such as the dust-free bedroom, should be employed. The antihistamine drugs may be used for symptomatic relief if they are effective. The functional factor should not be forgotten. Surgical therapy for polyposis is likely to be successful only if carefully and thoroughly carried out.

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SOUTH DAKOTA ENACTS "POUND" LAW

A "pound law" bill was passed by the South Dakota Legislature and signed by the Governor on February 15, 1951. The law becomes effective on July 1, 1951.

The bill provides that animals needed for medical experimental purposes may be obtained under license issued by the State Department of Health from establishments maintained by municipalities for the impounding, care and disposal of animals seized by lawful authority.

Institutions that may apply for such license are schools and colleges of agriculture, veterinary medicine, medicine, pharmacy, dentistry or other educational or scientific institutions properly concerned with the investigation of, or instruction concerning, the structure or functions

of living organisms, the cause, prevention, control or cure of diseases or abnormal conditions of human beings or animals.

The State Department of Health is empowered to adopt rules and regulations necessary to insure the humane use of animals in such experimentation with the right to inspect or investigate institutions licensed or applying for license to secure experimental animals.

The South Dakota action brings to a total of three, states that have recently passed similar legislation. Thirty-one communities also have effected policies concerning the disposal of unclaimed impounded animals for medical use. Legislation is now pending in seven other states.

BRONCHOSCOPY AND COMMON CHEST DISEASES

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IN the diagnosis and treatment of diseases of the chest, bronchoscopy is one of our more valuable aids. It often gives to the physician the final and only definite information on which a correct diagnosis can be established. It also provides a therapeutic approach which may be of the greatest importance in itself or as an adjunct to other therapy. To fully exploit and utilize this valuable diagnostic and therapeutic procedure, it is necessary that we be conversant with its potentialities, its limitations and its place in the orderly process of diagnosis and treatment.

Introduced slightly over fifty years ago, the bronchoscope at first found limited use, mainly in the larger medical centers and in the hands of the otolaryngologists. Its use in the mind of the average physician was surrounded by mystery and was associated mainly with the diagnosis and removal of foreign bodies in the respiratory passages.

Gradually the work of the pioneers in this field extended its usefulness and its application, until today bronchoscopic procedures play an important role in the work of the anesthesiologists, the chest surgeons, the specialists in diseases of the chest, especially in tuberculosis, as well as the otolaryngologists. The technical training of many men in these various specialties has made bronchoscopy increasingly valuable and important in the diagnosis and treatment of diseases of the chest and has extended its availability through these specialists to most members of the medical profession. Today this diagnostic and therapeutic aid need not be withheld from any patient who may need it.

Bronchoscopy may be explained as a procedure which enables us to extend our range of inspection. As the roentgen examination allows us to see beyond the confines of the skin and to observe certain normal and abnormal functioning of various organs and to note the changes produced by various disease processes, so bronchoscopy

enables us to inspect the main respiratory passages and to note their relative position, size, shape and function, as well as the changes brought about by disease. Within the range of vision (and this has been greatly increased by the use of modern telescopic equipment), it reveals obstructive situations such as are brought about by foreign bodies, benign and malignant new growths, granulomatous and cicatricial reactions resulting from inflammatory disease, mucous plugs, compression and torsion of bronchi, et cetera. It further enables us to note the appearance of the mucosa and the bronchial secretions and to associate certain changes with definite known disease processes. It permits us to obtain direct cultures and smears from bronchial secretions and tissue for biopsy, either by means of the cutting forceps, or by the gelfoam impression technique. Likewise bronchial washings of areas beyond the range of vision furnish valuable material for the pathologist versed in special cellular pathology. The removal of accumulated secretions and pus paves the way for more diagnostic bronchograms.

From a therapeutic standpoint, bronchoscopy permits the removal of foreign bodies, of abnormal secretions and of aspirated material. In the hands of the anesthesiologist, it is of special value in the postoperative inspection of the air passages and the removal of accumulated secretions—blood, pus, or aspirated material which might produce atelectasis. This is of unusual value following thoracic surgery and following obstetric and emergency surgery anesthesia where aspiration of vomitus may take place. Where postoperative atelectasis has taken place, it is often a lifesaving procedure by permitting the removal of mucous plugs and retained secretions. Dilatation of stenosed areas and aspiration of pus may be of considerable value in bronchiectasis, certain types of tuberculosis, lung abscess, and, occasionally, in bronchial asthma.

In the diagnosis of diseases of the chest, as in all diagnosis, it is important that the physician utilize all available and necessary diagnostic aids, but he must use them in a proper and sequential

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order. The first and most important step in any diagnostic procedure is to obtain a careful and a comprehensive history from the patient and from the family; and this certainly applies in diseases of the chest. Then must come an intimate acquaintance with the patient in the form of a thorough and complete physical examination and observation of the patient's reaction to the disease through changes in temperature, pulse and respiratory rates, total and differential white counts and sedimentation rates. At this point the diagnosis may be established or suspected, and the physician can determine if he needs additional laboratory studies, roentgenological consultation and bronchoscopic assistance.

In most cases of pulmonary disease, roentgen studies are indicated and will usually give a definite and conclusive diagnosis if the data obtained are properly correlated with the history, the physical and laboratory findings. Where the diagnosis is not conclusive at this point, or if confirmation of a tentative diagnosis is desired, bronchoscopic examination should be carried out.

In order to utilize and correlate these procedures to the greatest advantage, there must be the closest co-operation between the attending physician, the clinical pathologist, the roentgenologist and the bronchoscopist. It is the obligation of the attending physician to provide the clinical history and all available data so that proper and specific diagnostic procedures may be carried out.

Without such co-operation and guidance, improper and inadequate roentgenograms may result, the energies of the pathologist may be dissipated in looking for acid-fast bacilli when he should have been studying cellular pathology, and the bronchoscopist may be unable to proceed effectively.

I am stressing this point because all too frequently patients presenting symptoms of chest disease are sent directly to the x-ray laboratory for a chest film without obtaining the important history or the physical and laboratory data. This places the roentgenologist at a distinct disadvantage and he frequently cannot make an adequate examination. Then if the roentgen findings are indefinite, or uncertain (and they frequently are under such circumstances), a bronchoscopy is requested. Such a procedure can only result in dissatisfaction to all concerned and a very inadequate and often detrimental service

to the patient. In many instances, a careful history and physical examination, together with certain readily available laboratory procedures, would have established a diagnosis without the roentgen and bronchoscopic examinations, or would have rendered these examinations more valuable. They are expensive and often uncomfortable procedures for the patient and should not be ordered without due consideration, even as they should never be withheld when indicated.

What are the indications for bronchoscopic examination from the standpoint of the attending physician, and what are the contraindications to its use? In general, it may be said that it should be used whenever there is a history of the inhalation, or the possibility of inhalation of a foreign body, where the history and roentgen findings indicate bronchial obstruction due to new growth, either malignant or benign, where suppurative disease persists, where the cause of continuing cough and hemoptysis are unexplained, and whenever the roentgenologist needs help in interpreting certain abnormal findings.

Foreign bodies in the respiratory passages occur primarily in the younger age groups, 80 per cent occurring in individuals under the age of fifteen years, but they occur sufficiently often in the later decades so that we must be aware of this possibility. In children especially, the diagnosis can frequently be made from the history alone. At other times the diagnosis may be difficult. The presence of a radiopaque foreign body can be readily established by fluoroscopy or with a roentgenogram. The recognition of non-radiopaque foreign bodies is more difficult, and these are often overlooked. Here is where a careful history and proper roentgen studies are of the greatest value. Roentgen evidence of emphysema or atelectasis as noted under the fluoroscope, or on films taken on inspiration and expiration, is a definite indication for a bronchoscopic examination.

It is well to remember that after the initial coughing or gagging spell, an inhaled foreign body may produce no symptoms until it produces partial or complete obstruction of a bronchus. Many so-called recurrent pneumonias are due to unrecognized vegetable foreign bodies.

New growths, whether benign or malignant, may produce few and indefinite symptoms until obstruction of a bronchus occurs. When recognizable atelectasis has occurred, the diagnosis may

be obvious, but the optimum time for the removal of the lesion may have passed. If we are to make progress in the treatment of malignant disease of the respiratory passages and lungs, we must be alert to the earliest symptoms, such as unexplained persistent cough, localized wheezing respiration, and occasional hemoptysis. Patients presenting these symptoms should have the advantage of every available diagnostic facility, including bronchoscopy. Careful collection and study of the sputum may demonstrate malignant cells in a high percentage of cases. Occasionally tumor tissue is coughed up and may be imbedded in paraffin, sectioned and studied microscopically. The secretions aspirated directly from the involved bronchus, or washings from such a bronchus, have yielded as high as 90 per cent of positive findings in certain clinics. While bronchoscopy is of the greatest value in arriving at a diagnosis, it may not always be readily available. In such instances we should not hesitate to utilize sputum studies to the fullest extent.

In benign lesions, such as adenomas, the diagnosis will depend on the bronchoscopic appearance of the lesion and on a direct biopsy of the same. Single observations and biopsies may not establish a diagnosis, and in such instances, repeated examinations are indicated.

In suppurative conditions, such as chronic

bronchitis, bronchiectasis, and lung abscess, bronchoscopic examinations are indicated to rule out foreign bodies or other obstructing lesions, to determine the presence of stenosis, to obtain cultures and smears, to remove the accumulated secretions preliminary to bronchography, or for therapeutic purposes. These and other indications will occur to the conscientious physician as he attempts to solve the many complex diagnostic problems which face him. A careful analysis of all factors and sound clinical judgment should always direct his course of action.

The contraindications for bronchoscopy are few if the procedure is really indicated. It should not, as a rule, be employed in acute inflammatory disease of the respiratory passages or in the presence of active hemorrhage from the same. Caution in its use should be exercised in patients with heart disease, especially in the face of active or impending cardiac failure. It should be deferred or omitted if possible in patients with severe hypertension, with aneurysm, previous cerebral accidents, stenosis of the larynx or trachea, and in weak and debilitated individuals. In making a determination of whether the examination should be done in these patients, it is necessary to consider all factors and to be very certain that the need for the examination warrants the attendant risk and danger to the patient.

DDT INSECTICIDE SAFE IF WISELY USED

(Continued from Page 540)

mals being prepared for slaughter, the committee pointed out, since there is a danger of accumulation of the substance in the milk and tissues of treated animals.

Other precautions suggested by the committee are as follows:

"DDT insecticides should never be stored in food cupboards or medicine chests where there is a likelihood of contamination of food or mistaken use. All exposed foods, utensils, and working areas must be covered when kitchen and dining areas are being sprayed. Children's toys or cribs and rooms occupied by sick people should not be sprayed. Use of oil solutions on household pets should be avoided and DDT powders should be used only where they cannot be licked off. Intimate skin contact with aerosol discharge is to be avoided. Plants and aquariums in the home should be removed or covered before applying DDT sprays or aerosols. The use of oil solutions in the vicinity of open fires should be avoided because of the inflammability of such mixtures. . . .

"Persons exposed to large amounts of DDT dusts and powders under confined conditions or where dust particles are not carried away by free movement of air currents should wear respirators. [Chronic poisoning from DDT may result from prolonged ingestion or exposure to small amounts.] Such conditions might be

encountered in mass delousing procedures, larviciding with dusts, and manufacturing or formulating operations. Protective clothing should be worn when there is a possibility of greases and oils contaminating the skin, thereby enhancing the absorption of DDT dusts or powders. . . .

"Frequent or prolonged exposure to emulsions or solutions of DDT in petroleum oils and organic solvents should be avoided unless protective clothing, goggles and neoprene or solvent-resistant gloves are worn. [Only solutions may be absorbed through the skin.] Clothing must be changed promptly if concentrates are spilled on them. A contaminated skin area which has come in contact with DDT soaked clothing or spilled DDT concentrates should be washed immediately with soap and water. Concentrates should be mixed in well ventilated rooms and fire precaution observed when volatile and inflammable solvents are present. . . .

"Operators involved in large scale spraying or fogging with solutions of 5 per cent or more of DDT should wear respirators and other protective devices. Smoking is to be avoided during spraying when combustible mixtures are used. Greaseless skin lotions should be used on exposed body surfaces when irritant solvents are present in the formulation. Clothes should be changed and the body cleansed after each day's operation."—AMA News Release, March 9, 1951.

History of Medicine In Minnesota

MEDICINE AND ITS PRACTITIONERS IN OLMSTED COUNTY PRIOR TO 1900

NORA H. GUTHREY

Rochester, Minnesota

(Continued from the May issue.)

Pioneer physician of personal and professional merit, Harriet E. Preston was the first woman to seek membership, and one of the first three women to win it, in the Minnesota State Medical Society. Her experience in Minnesota resembled that of Dr. Ann Preston (1813-1872), native of Westgrove, Chester County, Pennsylvania, and graduate of the Woman's Medical College of Pennsylvania in 1852, whose name is forever linked with that college, in gaining professional place for women physicians in the hospitals of Philadelphia and in the Philadelphia County Medical Society. The story of Dr. Harriet E. Preston's persistent struggle for recognition, as recorded in the transactions of the Minnesota State Medical Society, makes good reading. In Winona, at a semi-annual meeting of the society in June, 1870, Dr. A. B. Stuart, at the request of Dr. W. W. Mayo, presented Dr. Preston's respectful request for "admission to the convention and for permission to take part in its deliberations." The physicians perhaps would have granted her admission to the convention; they balked at the idea of a woman joining in their deliberations, and refused her request by a vote of three to one.

Dr. Preston's candidacy for recognition started an argument that waxed and waned for ten years. At the beginning the proposed admission of women (specifically, Dr. Preston) was favored by Drs. Stuart, Mayo, Brewer Mattocks and W. W. Sweney; it was tolerated conditionally by others, notably Dr. C. N. Hewitt; and it was opposed bitterly by many, among them Drs. Solomon Blood, Alexander J. Stone and John H. Murphy. Dr. Murphy early foresaw defeat for he said, "This female-woman question is looming up and you can't stop it." In the arguments against admission of women the ancient clichés were aired: woman's physiological disability disqualified her; feminine delicacy would make impossible the frank discussion of certain matters that inevitably arise in medical practice; in short, woman's place was in the home. At Dr. Preston's second attempt, in 1871, the state society took refuge in the dignified statement that action could not be taken until the American Medical Association should accept as in good standing Dr. Preston's alma mater, the Woman's Medical College of Pennsylvania.

The American Medical Association at its meeting in San Francisco in 1871 debated the acceptance of delegates from "female colleges." It was distressing to learn that if members of the association were forbidden to recognize women physicians as colleagues and to consult with them professionally, it followed that members were barred automatically from recognizing the eminent Dr. Alfred Stillé, of Philadelphia, president of the American Medical Association, who was consulting physician at the Woman's Medical College of Pennsylvania. The whole subject was tabled indefinitely.

In 1871 also Dr. W. W. Mayo in a surgical report before the Minnesota State

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Medical Society made public acknowledgment of Dr. Preston's able surgical assistance in various operations for rectocele, construction of artificial perineum, and amputation of the cervix uteri. The Wabasha County Medical Society defined its position: "Resolved that this Society looks upon all regularly educated physicians as our equals and does not consider that we violate any of our professional obligations by consulting with them." In 1874 the claims of women physicians again were brought before the state society and were rejected by a vote of twenty-seven to thirteen, and they were quashed again the next year. In the ensuing five years record was not made of further discussion. In 1880, however, the Committee on New Members, made up of Drs. M. Hagen, C. N. Hewitt and F. A. Dunsmoor, proposed Dr. Harriet E. Preston, Dr. Clara E. Atkinson and Dr. Edith M. Gould, all of St. Paul, as members. There were only three adverse votes; the election was recorded as unanimous.

Dr. Preston, in St. Paul, continued as a member of the state society up to and through 1888; thereafter her name did not appear on the Minnesota Register. Long afterward it was learned from the Woman's Medical College of Pennsylvania that Dr. Preston was registered in 1915 as living in Pennsylvania; in 1923 she was listed, "address unknown"; in 1929, "died." In the period 1906-1929 her name did not appear in any issue of the directory of the American Medical Association.

Marion Putnam, one of Olmsted County's early practitioners of medicine, was in Oronoco in the middle eighteen seventies and perhaps for some time earlier. In 1877 he attended an old settlers' meeting in Kalmar Township and in that year also was a representative of the Oronoco Lodge of Good Templars at a conference in Winona. Notes on early medicine in Nicollet County (unpublished, 1947) state that Dr. Marion Putnam, of uncertain professional rating, was in the village of Nicollet in 1878 and 1879.

Henry Raymond Randall (1864-1890) was an assistant physician, the sixth professional appointee, at the Second Minnesota Hospital for Insane at Rochester for ten months beginning in January, 1889.

Born in St. Peter, Minnesota, on November 20, 1864, "Harry" Randall grew up in that village and there received his early education in the public schools. Early in 1887, on graduation from Rush Medical College with the degree of doctor of medicine, he entered practice with Dr. D. A. Stewart in Winona. His state license, No. 1309 (R), was issued on February 25, 1887.

Dr. Randall was a young man of fine personality and excellent native ability. Early in his residence in Rochester he became a member of the Olmsted County Medical Society and the Minnesota State Medical Society. In October, 1889, resigning his position at the state hospital, he returned to Winona to resume partnership with Dr. Stewart. His promising career ended in December, 1890, with his death from diphtheria, a few days after his twenty-sixth birthday.

J. E. Reece (or Reese) in the autumn of 1866 announced that he was settling permanently in Eyota, Olmsted County, for the practice of his profession. In the *Federal Union* of Rochester, on January 26, 1867, appeared this card: "Dr. J. E. Reece, Eclectic Physician, Eyota, Minnesota, gives constant attention to his profession and particularly to those branches related to all chronic diseases.

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He can be summoned from all quarters, far and near. His previous success warrants him in advertising." His notices have not been observed in issues of local publications after October, 1867.

Reginald Maxwell Reynolds (1843-1898), a graduate of Bellevue Hospital Medical College of New York in 1866, came to Rochester, Minnesota, in September, 1867. He has been described as a cultured gentleman of personal charm and a physician of high professional attainments.

Dr. Reynolds was a charter member of the original Olmsted County Medical Society that was founded on April 15, 1868, its first secretary, first chairman of the committee on chemistry, and one of the six members who drew up the society's fee bill.

Within the ensuing year Dr. Reynolds left Rochester temporarily; in February, 1869, he announced his return. He then was making his home at the residence of Z. J. Cowles and occupying the office vacated by Dr. J. S. Allen, a retiring senior physician. On September 8, 1869, Dr. Reynolds was married to Helen A. Cowles, one of the seven children of Zalmon J. Cowles and Sarah Huber Cowles, pioneer residents of Rochester. As mentioned earlier, a sister of Mrs. Reynolds, Kate Cowles, became the wife of the Hon. Joseph A. Leonard, of Rochester; another sister, Frances Kachicqua Cowles, was married to the Hon. Elmer E. Adams, of Fergus Falls.

In April, 1871, Dr. and Mrs. Reynolds removed from Rochester to Dixon, Illinois; a few months later they returned to Rochester, and shortly afterward, in 1871, they settled in Fergus Falls, where Dr. Reynolds for the next twenty-five years successfully practiced his profession. He is believed to have been the first physician in Fergus Falls and perhaps in Otter Tail County. In recent years a facsimile of the log cabin in which he first lived and practiced has been presented to the historical society of that county.

Beginning in 1872 Dr. Reynolds served as a division surgeon for the St. Paul and Pacific Railroad. In reports of the Committee on Epidemics, Climatology and Hygiene of the Minnesota State Medical Society in the early seventies he was quoted as an observer. His name has not been noted on the roster of the society; in 1874 action on his application for membership was deferred because he had not presented his diploma. He was licensed in Minnesota on October 15, 1883, receiving certificate No. 161 (R).

The following is an extract, received through the courtesy of Mr. Elmer E. Adams, from Mason's *History of Otter Tail County*:

Dr. Reynolds deserves more than a passing notice. He was a man who stood high in his profession; was learned in many branches outside of medicine, and had wonderful literary ability. His girl-like modesty to a great extent kept his light under a bushel, and none but his most intimate acquaintances fully appreciated his great resources. A student all his life, he read the classics as readily as his mother tongue, and could express himself in prose or poetry with remarkable felicity.

He could not make a speech in public any more than a mute; but, sit down with him alone, and he could talk by the hour and it would sound as though he were reading from a book. He had not been here long, surrounded by descendants of the old Vikings, before he could read their language with the best of them, and understand it as though it were his own. Though he was never strong physically, his work was strenuous. The country was sparsely settled and his rides covered a wide territory. In the winter of 1873, at the time of the great blizzard, the echoes of which have not yet died away, he was alone, and no physician to give him aid. Scores were frozen to death and many more crippled for

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life. He worked day and night, and performed numberless operations with no assistance except that of a young lawyer by the name of D. P. Hatch, who accompanied him and rendered such aid as he was able to give.

In 1895 Dr. and Mrs. Reynolds left Minnesota for Redlands, California, where the doctor grew oranges. He died in Redlands from cardiac disease in 1898 at the age of fifty-five years, survived by his wife. There were no children. Mrs. Reynolds lived many years after her husband, and her last two years she spent in Fergus Falls and in Rochester. Her death occurred in Rochester.

The name of **Roberts** has appeared in several connections, sometimes erroneously, with the practice of medicine in Olmsted County. The record remains obscure.

In April, 1881, *Dr. D. H. Roberts*, a homeopathist from Underhill, Vermont, opened an office in Eyota, over the general store of Blair Brothers; he was still in practice there a year later. In a gazetteer and business directory of the state the name was given "Dr. H. R. Roberts"; further data about him have not been observed. In 1883 a news item from near-by Dover stated that *Dr. G. W. Roberts*, "father of *Dr. Roberts, Jr.*," was very low and that all hope had been given up for his recovery.

The Dr. D. H. (or H. R.) Roberts of Eyota is not to be confused with *Dr. Daniel Hough Roberts*, a homeopathic physician (1824-1910), a native of Wayne County, Indiana, who came from Indiana into southern Minnesota about 1869 and who until 1903 made his headquarters in Owatonna. He was a founder of the Southern Minnesota Homoeopathic Medical Society, at Owatonna, in October, 1871, and was active in the affairs of the Minnesota State Homoeopathic Medical Institute. He was not a graduate of a medical school. Eckman, in 1941, in an article on homeopathic and eclectic medicine in Minnesota, reviewed Dr. Robert's life.

It has been said that Dr. Daniel Hough Roberts first and briefly was in Plainview, Wabasha County. Although the statement cannot be disproved, it seems likely that this physician has been confused with *Dr. Francis H. Roberts*, a homeopathic physician who came to Plainview from southeastern Indiana in 1868 and remained there, with the exception of a period in 1887-1889, when he returned to Indiana, until his death. His practice extended widely into Wabasha, Winona and Olmsted Counties. Dr. F. H. Roberts, of Welsh descent, was a graduate, in 1861, of the Western Homeopathic College, in Cleveland, Ohio, and held Minnesota state license No. 1429 (H), issued on May 28, 1887. He is recalled as a cultured gentleman and a reliable practitioner, who made many trips to Cleveland to attend medical lectures, had an excellent library, and subscribed to medical journals, chief among them the *Medical Observer*. Dr. Roberts' wife was the daughter of Dr. Ira Condit Perrine, of Sparta and Moore's Hill, Dearborn County, Indiana. Dr. Ira Condit Perrine was a cousin of Dr. Martin Thompson Perrine, who was the first physician, in 1855, in Rochester, Minnesota. A surviving daughter of Dr. F. H. Roberts is Mrs. Arthur (Mary) Searles of Plainview.

A **Dr. Robertson** from Freeborn County, Minnesota, a graduate of Rush Medical College, opened an office at the A. J. Russell residence in Pleasant Grove, Olmsted County, in April, 1892. He was welcome in the village, which had lacked a resident physician since Dr. Aaron L. Baker removed to Byron in the previous

September. After a few weeks Dr. Robertson also removed, to Waseca, Waseca County, it was said.

There is record in the *Official Register of Physicians of Minnesota* for 1883-1909, that in 1892 J. B. Robertson was graduated from Rush Medical College and in 1893 was licensed in Minnesota; in 1909 he was at Cottonwood, Lyon County.

Harvey Nehemiah Rogers (1837-1926), an eclectic physician and surgeon, was for twenty-one years a pioneer practitioner in southern Minnesota, five years in Oronoco, Olmsted County, and the next sixteen years in Wabasha County; thereafter he spent a few years in Wisconsin, in Whitehall and Chippewa Falls, and the remainder of his long life in Farmington, Dakota County, Minnesota.

A native of Raymond, Racine County, Wisconsin, Harvey N. Rogers was born on June 1, 1837, the son of Reuben Rogers, a farmer, and Sally McNair Rogers. Two brothers of Mrs. Reuben Rogers were physicians, a fact that may have influenced her son in his choice of profession. On his seventeenth birthday his father gave him forty acres of woodland to be cleared for agriculture. The boy was ambitious, however, for education beyond that gained in the district school, and after a few days of felling trees he offered to give back the land if his father would release him to continue his schooling. To outfit himself, he began working for his uncle at Mauston, Wisconsin, painting the barn for twenty-five cents a day. Later he attended Wayland Academy, where he earned his way by doing chores and odd jobs.

At the age of twenty-three years, on September 17, 1860, Harvey N. Rogers was married to Lucy Wright, a native of La Fargeville, New York, who was born on December 23, 1834. There were four children of the marriage, a son, Elliotson H. Rogers, and three daughters, Amarantha, Lutrella and Mabel E. Rogers.

Dr. Rogers received his diploma from the Eclectic Medical College of Pennsylvania, in Philadelphia, in 1864 (sometimes given 1865), and immediately after graduation left for Muncie, Indiana, to begin the practice of medicine. Sudden change in plan took him to Mauston, Wisconsin, where he enlisted in the Union Army. Records of the family show that in June, 1865, he was stationed near Greensboro, North Carolina, where he was assistant surgeon in the 177th Volunteer Regiment of Infantry, Second Brigade, Third Division, Twenty-third Army Corps.

In July, 1865, having been mustered out of the army, Dr. Rogers settled in Oronoco, Olmsted County, Minnesota. He was the only physician in the village, succeeding Dr. Hector Galloway, who had removed to Rochester, and occupying the Galloway residence on the south bank of the Zumbro River. The *Rochester Republican* of August 16, 1865, in announcing the doctor's arrival, said "The doctor's advent supplies a want much felt by the citizens of Oronoco, as no physician was to be had nearer than Rochester." On September 13 that newspaper reported, "Dr. H. N. Rogers wants a medical student. A young man who has the right material in him and wants to study medicine will find an extra good chance with Dr. Rogers."

In July, 1870, Dr. Rogers removed from Oronoco to Lake City, where he practiced medicine for a year. There Lucy Wright Rogers died and was buried in Lakewood Cemetery. Soon afterward with his four young children Dr. Rogers settled on a farm in section 20 of Guilford Township, Wabasha County, about two and a half miles northeast of Zumbro Falls and practiced medicine in the community. After the death of his first wife he was twice married: on February

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18, 1872, to Mary E. Conway, who died in 1903; and some time after her death to Lydia Berry. There were no children of these marriages.

In 1886, it is said, Dr. Rogers removed to Whitehall, Wisconsin, and subsequently to Chippewa Falls, that state, as noted, and a few years later to Farmington, Minnesota. On May 28, 1914, the citizens of Farmington showed their esteem for Dr. Rogers and their appreciation of his services by tendering him a banquet celebrating his fiftieth year of medical practice. Tribute was paid Dr. Rogers as educator, citizen, friend, and neighbor; there was a toast, "The Doctor and the Family" and, last, "Half a Century of Medicine."

Dr. Rogers died at his home in Farmington on September 8, 1926, survived by his wife, Lydia Berry Rogers, and his three daughters, Mrs. A. B. Boyce, of Farmington, Mrs. Lutrella R. Wilson, of Chicago, and Mabel E. Rogers, of Oak Park, Illinois. His son, Dr. E. H. Rogers, of Stevens Point, Wisconsin, preceded him in death on August 30, 1926.

Dr. Rogers' daughter, Mrs. Boyce, has stated that among her father's old papers is his certificate, in Latin, from the Southern Minnesota Eclectic Medical Association. (This society was incorporated on November 14, 1869.) Under the Minnesota "Diploma Law" of 1883 Dr. Rogers held certificate No. 909 (E), dated May 9, 1884. Further record appears in the following extract from a report of the sixty-sixth annual meeting of the Wabasha County Medical Society at Lake City on July 5, 1934: "A resolution was passed providing for the proper marking of the grave of Dr. Rogers, a pioneer physician in the county, one of the charter members of the Wabasha County Medical Society, at one time a practitioner in Lake City, a veteran of the Civil War, who died at Farmington, in 1926, and whose body now lies buried in Lakewood Cemetery, Lake City."

E. M. Roys was the third woman physician to practice in Rochester, Minnesota, it is believed, and perhaps was the first woman practitioner in the city who was a member of the regular profession. Of her predecessors one was a "magnetic healer" and the other described herself as an eclectic physician who treated all chronic diseases with electricity.

Dr. Roys' professional card appeared in the *Rochester Post* at intervals from January 11, 1868, to May 9, 1869; her office first was in Graham's Block and later in Head's Building. She was listed in *Mervin's Business Directory* of 1869-1870. On July 17, 1871, the *Central Record* of Rochester carried the following item: "Miss E. M. Roys, M.D., is about to be married and move to England to live. Miss Roys will be remembered as an old resident of this city and a practicing physician of rare merit, beloved by all who knew her. May she be happy in her new situation."

The name of Dr. Roys did not appear on the roster of the Olmsted County Medical Society, organized on April 15, 1868.

Herman Richard Russell (1871-1929) for thirty-three years was a physician and surgeon, twenty-four years in Stewartville, in his native Olmsted County, and nine years in St. Paul.

Born on June 10, 1871, in Pleasant Grove, he was the only child of Charles W. Russell and Martha J. Lovelace Russell, both of whom were born in Pennsylvania, and was a grandson of Richard S. Russell, a native of England, who came as a young man to the United States.

Richard S. Russell lived first in New York, later in Pennsylvania, and in 1856

came to Minnesota and settled with his wife and children on a farm in Pleasant Grove Township, Olmsted County, where he and his family became representative citizens. The children were: Caroline (Mrs. Fred.) Russell, Charles W., Mary (Mrs. Frank) Denny, Arthur James, Emmeline (Mrs. Edwin) Dorr, Richard Venango, Ross Henry and Nell (Mrs. Hugh) Neill. Of these children Richard Venango Russell, of Stewartville and Rochester, became widely known in southern Minnesota. A handsome man, finely built, more than six feet in height, of dignified presence, in his later years he wore his gray hair long and had chin whiskers: He bore a striking resemblance to the well-known pictures of the nation's "Uncle Sam" and because of this for many years was much in demand in the southern counties and in the Twin Cities to lead patriotic parades. Charles W. Russell, eldest son of Richard S. Russell, was the only member of the family old enough to serve in the Civil War; in 1862, just under eighteen years old, he was accompanied by his father when he went to enlist in Company H, Sixth Minnesota Volunteer Regiment of Infantry. After his military discharge at the end of three years he was a merchant in Pleasant Grove. He spent his last years in Stewartville, where he died on March 17, 1927.

Herman R. Russell received his early education in the village school of Pleasant Grove and at Darling's Business College of Rochester. After teaching school two years in Pleasant Grove, he matriculated, in the autumn of 1895, at the College of Physicians and Surgeons (after May 1, 1900, the College of Medicine, University of Illinois), in Chicago, for a course of four years. In 1898, still an undergraduate, he was licensed to practice medicine in Minnesota. In July, 1899, shortly after graduation with the degree of doctor of medicine, Dr. Russell began in Stewartville a practice that was interrupted only once, when for a few months in 1900 he served as locum tenens for his brother-in-law, Dr. Patrick H. Manion (a native of Olmsted County), of Charlotte, Iowa, while Dr. Manion was on an official mission of scientific study in Europe.

In Stewartville Dr. Russell had his offices successively in the Moore Block, the Davis Block, and in rooms connected with the Stoddard Drug Store. In the summer of 1922 he removed to St. Paul, where he had headquarters in the Pioneer Building, later in the Lowry Building, and at 608 South Smith Street. His residence was in Cherokee Heights, St. Paul. He built up a large practice and won an enviable place in the medical profession of the Twin Cities.

Throughout his career Dr. Russell was active in representative medical organizations: the Olmsted County Medical Society, the Southern Minnesota Medical Association, the Minnesota State Medical Association, the American Medical Association and the Ramsey County Medical Society. He kept abreast of his profession by reading, frequent clinical trips and postgraduate courses. After 1907 he began to give special attention to ophthalmology, otology, laryngology and rhinology and, after 1922, to urology.

A handsome, kindly, genial man, well trained and responsible, Dr. Russell as physician and citizen held the respect and regard of the communities in which he lived. In Stewartville he was for several years a member of the board of education, was president of the village council, and served a term as mayor. He was a member of the Masonic Lodge of Stewartville and of the Shrine of St. Paul and of Chicago. A reader of the best in literature, he held intelligent opinions on the wide range of subjects in which he was interested and was an entertaining conversationalist. His recreations were raising flowers and fishing; in his later years he became interested in raising guppies and other tropical aquarium fish, and locally was recognized as an authority on the subject.

HISTORY OF MEDICINE IN MINNESOTA

Herman R. Russell was first married on June 11, 1900, to Hannah Lucille Manion, one of the eight children of Mr. and Mrs. Owen Manion, of Eyota, pioneer Irish citizens of Olmsted County. Mrs. Russell, an able educator, had been a teacher in the Stewartville schools. There were two children of the marriage, Patrice and Owen. Mrs. Russell died in Cherokee Heights on December 2, 1926. Dr. Russell's second marriage, on February 14, 1929, was to Martha S. Schumann, a trained nurse, a graduate of St. Mary's Hospital School of Nurses Training, in Rochester, and one of the eight children of Mr. and Mrs. Adolph Schumann, natives of Germany, who from 1884 were well-known citizens of Stewartville and community.

On June 29, 1932, at the age of sixty-one years, Herman R. Russell died at St. Luke's Hospital, St. Paul, after a short illness from cardiac disease. Burial was in Acacia Park Masonic Cemetery at Pilot Mound, St. Paul. He was survived by his wife, his son and his daughter, Mrs. John Lindamann, both of Minneapolis, and his mother, who was a member of his household; Mrs. C. W. Russell died in Cherokee Heights on May 17, 1935. In 1947 Mrs. H. R. Russell continued to make her home in Cherokee Heights, Mrs. Lindamann was in Minneapolis, and Owen Russell in California.

Reuben Nathaniel Sackett (1825-1920), a man of fine character, a member of the regular school of medicine, it is said, and one of the first three physicians of Olmsted County, settled at Quincy Mills, Quincy Township, in May, 1855. His Christian names and their initials have appeared variously: Reuben Nathaniel, R. N., Nathaniel R., Reuben, and Nathaniel. In the writer's article on early decades of medicine in Fillmore County, notes on Dr. Sackett appeared in a biographical sketch of his son, Dr. Jay Le Roy Sackett (1858?-1890), who served his brief professional career in Lenora. The essential data about Dr. R. N. Sackett are repeated here.

Reuben N. Sackett was born on December 8, 1825, in Chautauqua County, New York. He obtained his general education and his medical training in his native state and began his medical practice in Syracuse. In May, 1855, as stated, he settled in Olmsted County, Minnesota, accompanied by his wife, Julia A. Palmer Sackett, to whom he was married in New York State on August 11, 1854. In Quincy Mills and a widespread surrounding community Dr. Sackett experienced the arduous medical and surgical practice of the time, giving faithful and generous service to the scattered pioneer families. Between 1865 and 1868 he was resident in near-by St. Charles, Winona County; for a short time thereafter in Chatfield, Fillmore County; and subsequently for many years, first in Windom, Cottonwood County, and second in Janesville, Waseca County (as late as 1909). Dr. Sackett was active in the Masonic order and as a charter member helped to organize lodges at St. Charles, Windom and Janesville. For more than seventy years he and his wife were supporting members of the Methodist Episcopal Church.

Dr. and Mrs. Sackett were the parents of three children, born at Quincy Mills: Nettie became the wife of A. G. Chapman, a lawyer of Lanesboro; a son of Mr. and Mrs. Chapman was the late C. A. Chapman, a banker of Rochester; a surviving daughter (1946) was Mrs. B. J. Morey, of Lanesboro. Jay Le Roy Sackett, M.D., died early in his career; Zilpha Estell died in infancy.

This pioneer physician and his wife spent their last years with their daughter in Lanesboro. Julia Palmer Sackett died on November 21, 1914; Reuben Nathaniel Sackett, on December 20, 1920, at the age of ninety-five years, from the infirmities of age. Their graves are in the Lanesboro Cemetery.

HISTORY OF MEDICINE IN MINNESOTA

Orin W. Sadler (1843-1929), who was born at Waukegan, Illinois, was the son of Mr. and Mrs. William Dexter Sadler. He was graduated from the Chicago Medical College in 1868 and probably in the same year began his initial practice in southern Minnesota. Eckman and Bigelow, in their article on the history of medicine in Dodge County, included him, as of West Concord, in their roster of pioneer physicians. Although Dr. Sadler lived for a considerable time in Dodge County and is known to have practiced in Wabasha, Wabasha County, and in Winona, Winona County, it has been established, on information from his niece, Mrs. J. A. Fiegel, of Rochester, that for a period he had his home in Byron, Olmsted County, and that during all his seven years in Minnesota he practiced to some extent in this county. Mrs. Fiegel was Ella Mary Vosburgh, whose parents, John Sharon Vosburgh and Mary Belinda Sadler Vosburgh, a sister of Orin W. Sadler, came by wagon from Wisconsin to Winona County, Minnesota, and thence, in 1856, to Salem Corners, Olmsted County.

Dr. Sadler was the first physician in Dodge County to become a member of the Minnesota State Medical Society, elected to membership at a session in Owatonna in 1869; his name remained on the roster through 1875. Once, at least, he assisted the Drs. Cross of Rochester in a surgical operation; he consulted with Drs. Garver and Willson of Dodge County in a case of insanity; and was a county physician in Dodge County.

He was married about 1870 to Emma Josephine Slocum, of Mantorville, Dodge County, a daughter of George W. Slocum and Rhoda C. Mantor Slocum, and a sister of Dr. Julius Franklin Slocum, who served his honorable but brief professional career in Marion, Olmsted County, in the early seventies. Dr. and Mrs. Sadler had four children, George, who died in infancy at Mantorville, Lucy, Orin and Samuel.

When Dr. Sadler left Minnesota early in 1875, he settled in Philadelphia, where he practiced into 1890; he was licensed in Pennsylvania in 1881. From 1890 until after 1907 he was in Pittsburgh; for the next few years in Johnstown. From 1913 for about twelve years he was resident in Mt. Dora, Florida, and briefly thereafter in Tarpon Springs. Dr. and Mrs. Sadler occasionally returned on visits to Minnesota: in 1875 in Mantorville, where the doctor, "an eminent oculist," at the Bradley House performed operations for crossed eyes, and again in 1879. In 1890 Mrs. Sadler with one child came to Mantorville and in 1894 with the three children she visited at the Fiegel home in Salem Township. After her death, in the early nineteen hundreds, it is believed, Dr. Sadler remarried; in 1916, accompanied by his wife, he visited in Rochester.

Dr. Sadler died of arteriosclerosis in Tarpon Springs, Florida, on January 2, 1929, at the age of eighty-five years, survived by his wife (who died in 1940) and his children. His son Orin, it is said, was a physician.

(To be continued in the July issue.)

President's Letter

THE ANNUAL MEETING, 1951

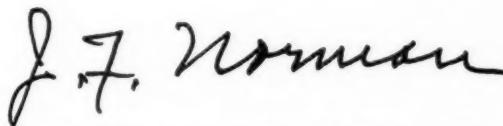
IN RETROSPECT, one has the feeling that the annual meeting of the Minnesota State Medical Association this year was an unqualified success. This was made possible in great part by the fine functioning of the various committees on arrangements, program, et cetera. Everything went on well and according to schedule. The Executive Secretary and his corps had everything under control and contributed very much toward making the meeting run smoothly. The meetings were well attended and the various addresses and demonstrations were excellent. The round table discussions were especially fine this year, from the point of view of teaching and discussion. Registrations were high, and many physicians from outside the state were present.

A very happy circumstance, always, is the renewal of friendships between physicians and former teachers, and between the members of the different classes. Many new acquaintances are made and old friendships renewed. It would seem that this is good, as it favors a united body of members of the profession. A dinner meeting of members of Minnesota Medical Foundation, Minnesota Medical Alumni, was well attended. Such meetings will continue to be held at the time of the State Medical meeting. The various specialty groups had their separate sectional meetings.

An outstanding number on the program, among other excellent numbers, was the symposium on new drugs—particularly the discussions on ACTH and cortisone. At the banquet, the members of the profession were very happy to hear the informative discussion presented by Dr. John W. Cline, San Francisco, California, President-elect of the American Medical Association.

The city of Rochester has one characteristic which should be mentioned—the universal spirit of helpfulness everywhere, whether in hotel, store, or the citizen on the street. This smiling courtesy helped to make the visit of the Association a pleasant one to be remembered.

We shall look forward to seeing you in Minneapolis next year.



President, Minnesota State Medical Association

Editorial

CARL B. DRAKE, M.D., *Editor*; GEORGE EARL, M.D., HENRY L. ULRICH, M.D., *Associate Editors*

CHOLESTEROL AND ATHEROSCLEROSIS

FOR MANY YEARS it has been known that cholesterol is one of the substances in atheromatous plaques of sclerotic arteries. While the physiology and pathology of cholesterol metabolism is not thoroughly understood, some facts are known. Cholesterol is an essential constituent of body cells and fluids. It has an extrinsic origin from ingested animal fat (meat fat, egg yolk, butter, cream, etc.). It also is formed intrinsically in the liver, is a component of bile and facilitates the absorption of fatty acids.

Cholesterol is a normal constituent of the blood. Its level in the blood is fairly constant for the individual but has a tendency to be slightly higher as age advances. It is higher in uncontrolled diabetes, obstructive jaundice, hypothyroidism and nephrosis and is reduced in severe liver disease, hyperthyroidism and certain febrile diseases.

It has also been known for many years that cholesterol feeding of rabbits will produce a hypercholesteremia and atherosclerosis. A natural conclusion was that the excessive ingestion of fat might be the cause of atherosclerosis in man, not laying much emphasis on the fact that the rabbit is herbivorous and cholesterol feeding does not produce hypercholesteremia or atherosclerosis in carnivorous animals. Man is omnivorous and there is little reason to infer that he will react like a herbivorous animal in this respect. But does he?

Reports are conflicting. Some have found that enormous amounts of ingested cholesterol results in only slight elevation of the serum cholesterol, most of it being eliminated in the stool. An automatic adjustment whereby when much cholesterol is available in the food, less is manufactured by the liver, has been reported. Keys has found little correlation between the cholesterol ingested and cholesterol blood levels. However on cholesterol-free and fat-free diets, steady and rapid decline in serum cholesterol was consistently noted. In one patient on a cholesterol- and fat-

free diet the addition of vegetable fat raised the serum cholesterol to previous heights. This suggests that cholesterol can be formed from other than animal fat, which is contrary to the general opinion. Further, many individuals with hypercholesteremia fail to show signs of atherosclerosis and likewise many with atherosclerosis fail to have an elevated serum cholesterol. Reports of cholesterol levels in the blood in individuals with coronary disease are not consistent. Those with histories of recent coronary infarction fail to present elevated blood cholesterol consistently.

Gofman who has interested himself in this relationship between fat and cholesterol in the diet and atherosclerosis explains this inconsistency in this way. By means of ultracentrifugation of blood he has studied quantitatively the entire spectrum of lipid and lipoprotein components in the serum. One layer of the lipoprotein molecule he finds consistently increased in recent coronary thrombosis and in those likely to suffer from a coronary attack. Moderate reduction of the fat and cholesterol in the diet is reflected by this test whereas the cholesterol level is not consistently lowered as recorded by the usual tests. This justifies his belief that a moderate reduction in the fat and cholesterol in the diet is effective in the treatment of atherosclerosis and that a total elimination of fat and cholesterol in the diet is not essential.

It seems essential that Gofman's tests with the ultracentrifugation of blood should be checked. Gofman's reports, along with the reasonableness of the recommendation of a reduction in animal fat as a preventive of atherosclerosis, has led many physicians to recommend the reduction or elimination of this type of fat and cholesterol in the diet. A most complete book of instructions for patients and diets has appeared.* All this may be a bit premature. It is well known, however, that in China, Costa Rica and Okinawa where the

*Dobbin, E. Virginia; Gofman, Helen F.; Jones, Helen C.; Lyon, Lenore and Young, Clara-Beth: The low fat, low cholesterol diet. New York: Doubleday and Company, 1951.

diets are largely vegetable, little atherosclerosis exists. Life insurance companies know the hazard of overweight. A reduction in overweight at any age is good advice. The question however has not been settled whether a moderate reduction of fat in the diet is sufficient or whether a vegetarian diet is necessary to reduce the elements in the blood that are responsible for atherosclerosis and its dire consequences.

The part choline administration will assume in the treatment of atherosclerosis remains to be established. It has been shown to be of value in slowing and reversing the atheromatous process produced in rabbits. Investigators have reported an improved mortality in coronary thrombosis patients by the administration of choline. Choline and a reduction in animal fats in the diet seem to be the best the profession has at present to offer in the treatment of atherosclerosis. Time will establish the value of the offering.

FINANCIAL RELIEF FOR MEDICAL SCHOOLS

THE COMMISSION on Financing Higher Education is an independent body sponsored by the Association of American Universities and financed by grants from the Rockefeller Foundation and the Carnegie Corporation. It is engaged in a long-range study of the financial problems of American colleges and universities. A statement put out by the Commission on May 16, 1951, on the subject of Financing Medical Education is succinct and to the point. The Commission does not favor federal subsidy of higher education in our country. If medical education should be directly subsidized there is every reason why other educational programs might also wish or demand support. The Commission believes "such a course would be dangerous to the intellectual heritage of freedom and diversity which characterizes American higher education." We agree.

The medical schools, however, are facing a critical financial problem. About an equal number of the seventy-two four-year medical schools of the country are units of public and private universities. The medical school has the most expensive course per student in any university.

The Commission, in its recent report, has offered certain suggestions to meet the present

financial dilemma. It does not believe that an increase in tuition should be made. The tuition is already the highest of any undergraduate or postgraduate department. The medical course, too, is the longest in all professional schools, which makes the medical course by far the most expensive of all departments. The Commission believes that certain economies may well be practiced in medical schools. It mentions too many courses, overlapping of courses and duplication of effort. We have thought for some time that the present-day medical course contains instruction that might well be deferred for the training of specialists. Inasmuch as accredited medical schools must operate with a teaching hospital and clinical facilities, medical instructional budgets often have a large amount of community service costs hidden within them. On the other hand, to our knowledge medical schools are in some instances relieved of expense by the contribution of clinical material and staff gratis by city hospitals. City hospitals, too, in some instances pay interns and residents while they are technically enrolled in a medical school. The Commission calls attention to the high cost of medical research. Some foundations and corporations which contribute funds for research fail to provide for the indirect costs of the research which only add to the budget of the medical school.

Even if all the suggested economies and adjustments are made, the medical schools still will need help and a lot of it. The seventy-two medical schools required 70 million dollars to operate in 1950. It is estimated they need an additional 10 million a year to continue operating on their present basis.

As mentioned in an editorial which appeared in our January issue, the AMA House of Delegates at Cleveland last December approved the appropriation of \$500,000 to establish the American Medical Education Foundation for the support of the medical schools. The California State Medical Association added \$100,000 and the members of the profession were invited, yes urged, to contribute \$100 per member. If every physician contributed his \$100, some 18 million dollars would be raised and the problem solved. Pitifully few Minnesota doctors made a contribution. Doubtless, most felt the futility of the doctors of the country attempting to contribute a fund sufficient to maintain the medical schools in the black. The medical schools would need finan-

cial assistance from a wider field than just the medical profession. This has now happened. A National Fund for Medical Education has been established with the sponsorship of industry, organized labor, agriculture, a group of university presidents, twelve scientific and educational foundations, as well as the medical profession. The goal for 1951 is 5 million dollars, one million of which has already been collected. Contributions to the American Medical Education Foundation are to be funneled to this new National Fund for Medical Education. Those of us who can possibly afford to make a contribution of \$100, or even less, should do so. Contributions should be sent to the American Medical Education Foundation at AMA headquarters. Any contributions are deductible from Federal income tax returns.

BARUCH COMMITTEE TERMINATED

THAT MONEY can be the means of accomplishing much good is illustrated by the accomplishment of the Baruch Committee on Physical Medicine and Rehabilitation. The committee was established by Bernard M. Baruch of New York City to develop the field of medicine devoted to the diagnosis and treatment of disease by physical means and to the rehabilitation of disabled persons. Mr. Baruch has donated over 2 million dollars personally to the support of this branch of healing in honor of his father, the late Dr. Simon Baruch, who was the leading medical pioneer in this field.

As a result of the activities of this committee, there has been a marked increase in the teaching of physical medicine in the medical schools of the country; there has been a great increase in the number of residencies in physical medicine in the hospitals; thousands of wounded soldiers and sailors as well as injured civilians have been rehabilitated; a new Section on Physical Medicine and Rehabilitation has been formed in the AMA; the American Board of Physical Medicine and Rehabilitation to certify specialists in this field has been established.

Dr. Ray Lyman Wilbur provided remarkable leadership in the organization of the work of the committee until his death in June, 1949. Dr. Frank H. Krusen of Rochester, who has been carrying on in Dr. Wilbur's place, announced last month that the committee has achieved its goal

and is discontinuing its activities. The committee is dead. Long will live the results of its existence.

NATIONAL DOCTORS COMMITTEE FOR IMPROVED FEDERAL MEDICAL SERVICE

DR. ROBERT COLLIER PAGE is chairman of the National Doctors Committee for Improved Federal Medical Service. An advisory committee of experts from every branch of the medical profession has been appointed to consult with the chairman of the committee on matters of policy. Dr. Page is the Medical Director of Standard Oil Company of New Jersey.

The National Doctors Committee is an affiliate of the Citizens Committee for the Hoover Report which is urging the passage of the recommendations of the bipartisan Hoover Commission for the unification of the various governmental medical agencies under a single authority. The slogan of the Doctors Committee is: "Not more government in medicine but better medicine in government." Economy is one of the main objectives of the committee.

It will be recollected that the task force of the Hoover Committee recommended that federal governmental medical activities, except the army and navy hospitals, be organized as one unit with a trained medical man at the head holding a cabinet position; and that this branch of the federal government be not combined with the Department of Social Security and Education with a layman at the head as urged and almost accomplished by Oscar Ewing.

The saving in Federal spending which would be accomplished by the unification of these governmental medical activities would be considerable.

When the use of anesthetics was first introduced in England, the clergy, almost without exception, denounced it, saying the Lord wanted us to suffer and doctors had no right to make patients unconscious and free from pain. A young Scotch doctor advised clergymen to read in Genesis how "The Lord caused a deep sleep to fall upon Adam" before he took out his rib.

Medical Economics

Edited by the Committee on Medical Economics
of the
Minnesota State Medical Association
George Earl, M.D., Chairman

AMA PRESIDENT SCORES AGAINST EWING

A few well-chosen, forceful words were aimed recently at Oscar Ewing by AMA president, Dr. Elmer Henderson. Dr. Henderson expressed the view of American doctors, and went on to repudiate Ewing's statements with such adeptness that it is doubtful whether the Federal Security Agency will ever attempt a similar tactic.

Dr. Henderson had quoted a "current" FSA pamphlet which said:

"Social security and public assistance programs are a basic essential for attainment of the socialized state envisaged in democratic ideology, a way of life which so far has been realized only in slight measure."

Speaking for the Federal Security Agency, and characteristically hedging to avoid the issue, Ewing denied the currency of the pamphlet:

"... Elementary check would have revealed that pamphlet was written and issued in 1945, some two years before I became Federal Security Administrator. Checking would also have revealed that this pamphlet is not being currently distributed by Federal Security Agency, and has never had remotest authority as directive."

Actual proof of the pamphlet's currency was then presented by Dr. Henderson, with appropriate comments as an added flourish:

"We note your denial of responsibility for the pamphlet on the grounds that it was published in 1945 before your tenure as administrator of that office. This denial, as you request, will be duly reported in *The Journal*. You are correct in assuming that as a reputable scientific periodical it is the habit of this journal to verify statements before publication. The facts concerning my reference are these.

"The pamphlet in question was reprinted for distribution by your office in 1949, when the public record indicates you were in charge of the Federal Security Agency, its publications and its directives to employees. Five copies were received in the mail here last week, which indicates certain currency still. These all carry the imprint, 'Government Printing Office, 1949.' The fact that the report was first printed in 1945 would not seem

to alter the further fact that you apparently have thought well enough of it to have it reprinted in 1949."

Ewing had prematurely requested *The Journal of the American Medical Association* to retract its quotation from the FSA pamphlet, "as publicly as it was made in the first place." After proving himself correct, and publicly telling Mr. Ewing so, Dr. Henderson went on to give Ewing some well-deserved advice:

"We would suggest that if you wish at this time to disavow the principles expressed in the pamphlet, you will wish to do so in a formal statement to Congress, for as recently as February 26 of this year, it was protested on the floor of Congress as grave misuse of taxpayers' money to disseminate wholly un-American philosophies."

A final jab at Ewing and his flagrant denial of fact, is taken by Dr. Henderson:

"In case it was without your knowledge that your office was reprinting and distributing such un-American directives during your tenure, you may wish to issue a public statement disclaiming responsibility for the material. If so, we shall certainly be glad to be helpful in giving such a statement further distribution through *The Journal*, for the medical profession will be sincerely interested in any such action."

NEW FUND PLAN TO AID MEDICAL SCHOOLS

Financial assistance for all the nation's hard-pressed medical schools was promised recently in the establishment of the National Fund for Medical Education. The Fund, representing the culmination of two years of planning and organization, has the sponsorship of industry, the medical profession, organized labor, agriculture, a group of university presidents and twelve scientific and educational foundations.

The Fund has more than \$1,000,000 to start it on its \$5,000,000 goal for the first year. The American Medical Education Foundation, begun by the American Medical Association last December, will funnel all its contributions from

doctors through the new organization. The National Fund plans to make these and other grants available immediately to the nation's medical schools.

Already machinery is set up to distribute the money equitably among the medical schools of the country. Guidance was gained by the Fund's Advisory Council, including university presidents, representatives of the AMA, the Association of American Medical Colleges and medical directors of leading philanthropic foundations.

Although no one claims that provision of \$5,000,000 annually will completely solve the budgetary problems of America's fine medical schools, there is, at the same time, a feeling that the National Fund represents concerted efforts of a group of Americans earnestly trying to solve a problem that they know will affect this country in many ways. Chief objective of the Fund is to seek voluntary contributions—a characteristic American way of doing things.

In announcing the plan at the sponsoring group's annual meeting, S. Sloan Colt, Fund president, said, "What is most gratifying and significant is the fact that this vital project has brought together as trustees a broadly representative group of men and women. Those who organized the Fund may have differing social viewpoints but, insofar as the Fund is concerned, we have united in an endeavor to solve a serious problem for the common good. Unless the medical schools are given financial help, and given it quickly, the standards of medicine may be permanently impaired and the nation's health affected adversely."

BRITISH HEALTH SERVICE HEADS TOWARD BANKRUPTCY

Full-fledged bankruptcy of the British Health Service is now clearly and coldly foreseen by the British Medical association. Many people in a position to observe the situation objectively have wondered why bankruptcy has not come sooner. Expressing discontent and disillusionment, a recent *British Medical Journal* says:

"The medical profession is discontented and disillusioned, not because of payment, or lack of it, for this or that, but because it sees postponed indefinitely the opportunities for improving the medical care of people. . . ."

Through all its struggling to maintain high medical standards under a hopelessly inefficient

system, the British medical profession has not lost sight of its basic principle—improving medical services to the people—but realization of this goal is receding fast, under the pressure of a top-heavy, structurally unsound program of medical care.

The editorial in the *British Medical Journal* explains to its readers the main reasons for failure of the medical scheme:

"Not only are we facing bankruptcy because of the Utopian finances of the Welfare State. We are, as a profession, facing the bankruptcy of a policy based on the decisions of the Coalition Government during a war for survival and put into execution by a Minister of Health who could not resist the temptation to behave like a Fairy Godmother to an impoverished nation. . . ."

"The honeymoon period of the Welfare State is over. The uneasy marriage between the medical profession and the State is now undergoing the strains of an unbalanced domestic economy . . . the public has run riot in the chemist's shop—at what a cost it is only just beginning to discover. The shocking waste of public money over the inessentials of medicine has left little over for what is more urgently needed. . . ."

ASSOCIATION SETS UP RURAL MEDICAL SCHOLARSHIP

A rural medical student scholarship, designed to promote even better distribution of physicians throughout the state, was approved by the House of Delegates of the Minnesota State Medical Association at the annual meeting in Rochester, April 30, May 1 and 2.

Dr. F. J. Elias, Duluth, chairman of the Committee on University Relations, submitted the plan to the delegates. He presented the purpose of such a scholarship as follows:

"In the first place, it is the distinct effort on the part of organized medicine to solve one immediate, fundamental social problem, the distribution of physicians. This primary purpose is to be accomplished by providing financial aid in the form of a scholarship to at least one new medical student a year, who agrees to engage in general practice in a town of 5,000 population or less for a period of at least five years."

The new plan provides \$1,000 a year for four years to a beginning medical student from a small town or rural area. Eligibility depends on three factors: financial need; residence in a rural area or town of less than 5,000 population; and an agreement to engage in general practice in a town of the student's selection from a list furnished by the state medical association and the Minnesota State Board of Medical Examiners.

Minneapolis Surgical Society

Meeting of October 5, 1950

The President, Harvey Nelson, M.D., in the Chair

PRIMARY OSTEOTOMY FOR THE TREATMENT OF INTRACAPSULAR FRACTURE OF THE NECK OF THE FEMUR

MAYNARD C. NELSON, M.D.
Minneapolis, Minnesota

The all too frequent occurrence of non-union of intracapsular fractures of the neck of the femur is well known. In reviewing these fractures at the Minneapolis General Hospital, we were impressed by the number of patients with non-union, even though their fractures in a majority of cases had been accurately reduced and internally fixed properly. Because of this and because of the frequent necessity of multiple operations to obtain a stable hip, we began to wonder if our initial approach to the problem was correct. It was thought that perhaps some procedure combining the advantages of internal fixation and those of secondary operations for non-union could be used to advantage in the treatment of fresh intracapsular fractures. Therefore the different operative procedures devised for the treatment or prevention of non-union of intracapsular fractures were investigated. The chief aims of these procedures are to restore stability to the hip, to diminish pain, and to restore a variable degree of muscular control about the hip joint.

Whitman¹⁵ recommended his reconstruction operation for the treatment of ununited intracapsular fractures with considerable neck absorption. The head of the femur is removed and the greater trochanter with its attached muscles is cut off obliquely. The stump of the neck thus created is placed into the acetabulum and the limb is abducted twenty-five degrees. The trochanter is then secured more distally on the lateral aspect of the femur to restore the normal distance between the origin and insertion of the abductor muscles. A hip spica is used.

Albee¹ cited non-union and aseptic necrosis of the head as indications for the use of his reconstruction operation. As in the Whitman operation the head is removed and the neck stump placed into the acetabulum. A bone-muscle lever about four inches long is then cut from the trochanter and upper femoral shaft to restore ability to abduct the hip. Here again a hip spica is used.

Colonna⁵ listed non-union with complete absorption of the neck as the indication for use of his reconstruction operation. The head of the femur is removed and the muscles inserting on the greater trochanter are severed close to the bone. Then the greater trochanter is placed into the acetabulum and the severed abductor muscles are fastened distally on the femur. Here too a spica cast is used.

The Brackett³ operation is recommended for use in treating cases of non-union with almost complete absorption of the neck and with aseptic necrosis of the head. In this operation the neck stump is rounded off and placed into the scooped out head. The abductor muscles with a shell of bone are severed from the greater trochanter and reimplanted distally on the femur. As in the previous procedures a hip spica is used.

Use of the Luck⁹ reconstruction operation is contraindicated when there is a dead or disintegrated head or when disabling arthritic changes are present in the hip joint. In this procedure the femur is cut transversely at the level of the lower border of the neck; the fracture surface of the head is freshened; and the head is then placed on top of the denuded upper femoral shaft. The trochanter with its attached muscles is placed lower on the lateral aspect of the femoral shaft and a Steinman pin inserted through the trochanter and shaft into the head. If this fixation is not secure, a plaster spica is applied.

The osteotomy of von Baeyer¹⁴ and Lorenz⁸ is of the linear type (bifurcation). The cut begins low on the lateral aspect of the femur and ends medially above. It is situated entirely below the lesser trochanter. The lower femoral fragment is then forced up against the acetabulum and the two sections of the femur approximated by abduction of the extremity. Stability of the hip is restored by the pelvic support obtained through the medial bony spur and power of abduction is regained through increased tension of the gluteal muscles.

The osteotomy described by McMurray¹⁰ is an oblique or linear osteotomy which begins laterally at the level of the lower margin of the lesser trochanter and extends upwards and medially to end at the level of the upper margin of the lesser trochanter. After the cut is made the leg is abducted and the femoral shaft displaced medially under the head. Because of muscle attachments common to both osteotomy segments, this medial shift of the distal fragment produces adduction-rotation of the proximal fragment. A more horizontal fracture plane with diminution of shearing force results. A plaster hip spica is used for immobilization. Because old ununited femoral neck fractures were treated by this method with a high degree of success, McMurray¹¹ and Murphy¹² used it for the treatment of fresh intracapsular fractures.

The cervical-axial osteotomy of Leadbetter⁶ differs

from the McMurray procedure in that the osteotomy is made within the capsule of the hip joint at the junction of the middle and lower thirds of the long axis of the neck. Posterior displacement of the distal fragment is thereby prevented. After the bone is sectioned, the femur is then forced medially and the head rotated so as to lie with its fracture surface on the freshly cut neck. A plaster hip spica is used for immobilization.

The Blount² osteotomy is similar to the McMurray procedure except that it is done at the level of the lesser trochanter to allow more adduction rotation of the proximal fragment. The distal fragment is not completely displaced medially. The osteotomy is fixed by means of a blade-plate to obviate the necessity of using a cast.

Pauwels,¹³ in 1929, described a wedging type of osteotomy based on the results of his studies of the various forces of pressure, shearing and tension that exist at a fracture site in the neck of the femur. A vertical force exerted on the head of the femur in a femoral neck fracture was thought by Pauwels to be divided into a pressure and a shearing component. He felt that the course of healing of the fracture is determined by which of these forces predominates and showed that shearing force first becomes effective when the fracture is more than 30 degrees off the horizontal plane. As the angle increases, the pressure component decreases and shearing effect increases. The wedge, in Pauwels' operation, is removed just below the lesser trochanter and is of sufficient size to reduce the fracture angle to less than 30 degrees off the horizontal plane.

Camitz,⁴ in 1931, recommended the use of an osteotomy with a wedge, two centimeters wide at its base, removed at the level of the lesser trochanter for the treatment of non-union. Linton,⁷ between 1939 and 1941, performed wedge osteotomies on four cases of recent intracapsular fractures in which the prognosis for healing was considered bad due to pronounced obliquity of the fracture plane. Linton is the first author on record to recommend the use of wedging osteotomy combined with internal fixation of the fracture site. He advocated a Smith-Petersen nail for this purpose. However, both he and Camitz used spica casts for immobilization.

After investigating the above procedures, it was felt that perhaps internal fixation of the fracture combined with a wedging type of osteotomy (described by Pauwels,¹³ used as a primary procedure by Linton,⁷ and used by Moe for non-union) would be most likely to accomplish our aim to find a single procedure which could be used for the treatment of fresh intracapsular fractures of the femur and which might result more frequently in primary union. With the hope that this theory might be proved, the first of a series of fifty-two of these procedures was carried out at the Minneapolis General Hospital on October 1, 1946. This was done by Dr. Frank J. Ankner, senior resident in surgery at the Minneapolis General Hospital. Dr. Ankner also either performed or personally supervised the great majority of these operations as partial fulfillment of the requirements for his Ph.D. thesis.

Discussion of the Proposed Osteotomy

In selecting the exact type of osteotomy to be used, two main problems arose: (1) the size, position and shape of the wedge, and (2) a method of internal fixation of both the fracture and the osteotomy which would obviate the use of a plaster hip spica.

The Wedge.—The problem of the size of the wedge was first considered. It was decided that sufficient bone should be removed so that the final result would be a head, neck and shaft in a straight line. Calculations to determine the measurements of the wedge proved to be indefinite and actual trials at operation were necessary. The size of the wedge was increased in successive cases until it was determined that closure of a defect left by the removal of a wedge with a base of one inch, *when removed at the level of the lesser trochanter*, results in the head being in a direct vertical line with the shaft of the femur. It was further found that closure of such a defect causes the femoral fragment proximal to the osteotomy to rotate 40 degrees toward the vertical. Because a similar change in the fracture plane takes place with any change in the position of the neck, even the most oblique or vertical fracture line will not remain over 50 degrees off the horizontal plane after a rotational shift of 40 degrees. According to Pauwels¹³ and Blount² reduction of the plane of a femoral neck fracture to less than 50 degrees off the horizontal plane reduces shearing force enough so that a high rate of union may be expected.

The wedge was first cut according to the technique previously used by Moe in secondary osteotomies for the treatment of non-union of intracapsular fractures. The upper line of the wedge was cut perpendicular to the shaft of the femur, and the lower line extended inferiorly and laterally from the apex of the wedge. Closure of such a defect resulted in a markedly oblique osteotomy line. In order to produce an osteotomy with no shearing effect at its site, the wedge was reversed. The end result then was a horizontal osteotomy line.

The Fixation.—For fixation a method devised by Moe for use in secondary osteotomies was modified for use in this osteotomy. The Moe plate has a curved portion to fit the trochanter and a shaft which fits against the shaft of the femur. With the curved portion in place, the shaft portion protrudes about 25 degrees from the femur before closure of the osteotomy defect. This was modified so that now this angle is 40 degrees. There are three holes in the curved portion through which hip screws can be inserted for fixation of the fracture. To adapt the plate for use in this osteotomy, it was necessary to cut off the part containing the top hole and to drill a new hole immediately adjacent to the osteotomy site.

The Question of Early Ambulation

It was felt that perhaps early partial weight bearing before healing of the fracture could be permitted and so avoid later difficulties with reambulation of these patients. The possibility that early weight bearing might cause collapse of an avascular head was recognized,

but due to the rotation of the head after osteotomy the superior aspect of the head, which is so prone to collapse due to its late revascularization, does not bear the brunt of the trauma. Instead, the area near the fovea, which usually remains viable in a dead head, is rotated superiorly to form the weight-bearing surface. At first alternate patients were allowed early partial weight bearing. Later only those with a fracture line less than thirty degrees off the horizontal plane after operation were put on this regimen.

Selection of Patient

At first it was decided to use this operation for all patients with an intracapsular fracture. Later, only those patients whose fracture lines were fifty or more degrees off the horizontal plane and in whom, therefore, a high incidence of non-union was anticipated were selected for osteotomy.

The Technique of Treatment of Intracapsular Fracture by Primary Osteotomy

The details of treatment will be discussed briefly. On admission the patient is adequately sedated and x-rays are obtained. Adhesive-type traction with ten pounds of weight is applied to the injured extremity. In the pre-operative period the usual clinical and laboratory evaluations of the patient are made.

For the operation general anesthesia is used. Reduction is obtained by either the Leadbetter maneuver or the table-traction method. The angle of the fracture line is measured on the antero-posterior x-ray of the hip in full internal rotation.

This is done in the manner of Linton⁷ in which a horizontal line is drawn perpendicular to the shaft of the femur so as to cross a line through the fracture. This allows measurement of the number of degrees that the fracture is off the horizontal plane.

A lateral incision is used. The modified Moe plate is held in place on the trochanter and the shaft bent to the proper angle. Kirschner wires are then inserted through the holes of the plate into the neck and head of the femur and x-rays obtained. With these x-rays for guidance, three hip screws of proper length are inserted into the desired positions. A wedge of bone with a base of one inch is removed from the femur starting at the level that the shaft of the plate diverges from the femur. The superior cut is diagonal and the inferior is horizontal. The bone removed is cut into small pieces and inserted into the medullary cavity at the osteotomy site. The wedge defect is then closed by adduction of the limb. Rotation is prevented by lining up marks made on the bone above and below the osteotomy before the wedge is removed. The shaft of the plate is now affixed to the shaft of the femur by small screws.

Postoperatively the patient is again placed in adhesive-type traction with ten pounds of weight for five days to alleviate the pain due to muscle spasm produced by the trauma of surgery. After this all patients are made ambulatory as soon as possible.

Analysis of Cases and Results Obtained

The first of fifty-two primary osteotomies for the treatment of fresh intracapsular fractures of the neck of the femur was done at Minneapolis General Hospital on October 1, 1946, and the last on September 24, 1948. Results in these patients were studied up to January 28, 1949. Those patients operated upon in the last six months of this period were excluded from the study leaving forty-five for final evaluation. Because insufficient time has elapsed the data to be presented are given as primary and not final end results.

Age.—The average age of the forty-five patients studied was 71.7 years. Ninety-three per cent were sixty or more years of age and 60 per cent were seventy or more years of age.

Mortality.—The operative mortality was one patient in forty-five (2.2 per cent). This patient died on the fourth postoperative day of a cerebrovascular accident.

The hospital mortality was three patients in forty-five (6.7 per cent). The fracture, not the surgery, was regarded as a contributory factor in these deaths. Two of these patients were eighty-four years old and the other eighty-five. One had carcinoma of the prostate with bone metastases; the other two were totally demented and required constant restraint. These patients died eleven, thirty-seven, and fifty-one days after surgery of bronchopneumonia.

The incidental mortality was eight patients in forty-five (17.8 per cent). All died after leaving the hospital from causes unrelated to their fractures. They ranged from seventy-four to eighty-two years of age. The time of death was from two to eighteen months after injury.

The total mortality, therefore, was twelve patients in forty-five (26.7 per cent). The average age of the patients who were living was 69.4 years, while those who died averaged 78 years of age.

Postoperative Complications.—The postoperative complications were severe in a few instances and minor in others. One patient developed a huge ulcer on the dorsum of the foot from the pressure of the straps used to secure the extremity to the table. Another patient developed popliteal artery thrombosis. Both required amputation. Stitch abscesses in two instances were the only wound infections. In one of the early cases in which the original Moe plate was fixed with only two screws extending through the plate and across the fracture site, disruption occurred at the osteotomy site. A violent mental patient who walked about in her room postoperatively on several occasions completely disrupted both fracture and osteotomy sites.

X-Ray Analysis of the Fractures.—There were thirty-two of the forty-five patients for evaluation of their primary end results since twelve had died and one was not followed. All thirty-two patients were x-rayed and were personally examined at the end of the study period by a team of three doctors under the direct supervision of Dr. Frank J. Ankner.

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The important aspect of the preoperative analysis of the x-rays was the measurement of the angle of the fracture line. The fracture lines in two patients were too irregular to measure. In one early case there was a fracture angle of 38 degrees. The remaining twenty-nine patients all had fracture lines 50 degrees or more off the horizontal plane. The average fracture angle in these thirty patients was 61 degrees.

Twenty-seven of the patients had satisfactory and five had unsatisfactory reductions of their fractures. In three of the cases with unsatisfactory reductions, non-union resulted.

In two patients with non-union and severe neck erosion, the fixation screws backed out to such an extent that their removal was necessary.

Moderately severe arthritis of the hip joint developed in two patients who obtained union of their fractures, but had unsatisfactory functional results due to pain.

Aseptic necrosis was difficult to evaluate or grade. Ten patients showed some degree of necrosis but seven of these were quite minimal and consisted of only occasional cystic areas and sometimes very slight irregularity of the head but no flattening or collapse. This gave a "clinical degree" of aseptic necrosis in three out of thirty-two patients. Two of these had non-union and one had union at the fracture site.

Ten patients showed moderate to severe femoral neck erosion (absorption of one-half or more of the neck). However, all of the patients showed some degree of this change.

Union at the fracture site occurred in twenty-four (75 per cent) of the thirty-two living patients. Contrary to what was expected, the average age of the patients with union (69.4 years) was approximately the same as that of the patients with non-union (68.9 years).

Functional End Results.—Functional end results were expressed by grading each patient as A (excellent), B (good), C (fair), and D (poor). As an example of the stringent requirements used in awarding these grades, grade A function means that the patient had no pain in the hip when lying on the affected side, when sitting, or when walking. Furthermore, this grade means that the patient could walk without support of any kind, had no more than a negligible limp, could sit or rise from a chair unassisted, could pick things off the floor, could kneel down and rise unaided, could tie either shoe lace, could cross either knee over the other, and could walk up and down stairs one foot after the other without even using the hand rail. The patient must have had 90 degrees or more of hip flexion (or at least 80 per cent of that present in the opposite hip), 180 degrees of hip extension, 25 degrees of abduction (or 80 per cent of that in the opposite hip), 15 degrees of hip adduction (or 80 per cent of that in the opposite hip), 35 degrees of external rotation, and the ability to rotate his extremity so that the toes pointed straight forward. Grade A means, of course, that the patient had a negative Trendelenburg sign. The requirements for Grades B, C and D were progressively less exacting. Patients with Grades A, B, or C were considered

to have had satisfactory and those with Grade D unsatisfactory functional results.

Only twenty-four patients could be evaluated for function. Five of the eight remaining patients had spastic paralysis prior to their fractures, two had had amputations as mentioned above, and one was bedridden with a recent fracture of the opposite hip. The patients with union (nineteen) and with non-union (five) were evaluated separately.

Of the nineteen patients who obtained union, four (21 per cent) had excellent, ten (53 per cent) had good, and three (16 per cent) had fair function. Therefore, 90 per cent of the nineteen patients with union had satisfactory function. The two patients in this group with unsatisfactory function were those mentioned above who developed painful osteoarthritis postoperatively. If the two patients who had had amputations are included as failures, then only 81 per cent of the patients with union had satisfactory functional results.

Of the five patients with non-union, three had fair and two had unsatisfactory functional results. In the combined group (unions and non-unions) there were twenty patients out of twenty-four (83.3 per cent) with satisfactory functional results. If the two patients with amputation are included, there were twenty patients out of twenty-six (78 per cent) with satisfactory functional results.

The study was not large enough to allow a statistically significant evaluation of the effect of early weight bearing on union, neck erosion, aseptic necrosis, and function. However the results indicate that weight bearing should not be allowed until there is x-ray evidence of bony union.

Summary

Operations used in the treatment of non-union of intracapsular fracture of the hip are briefly described under two headings, the reconstructive and plastic procedures and the osteotomies.

The treatment of fresh intracapsular femoral neck fractures by primary wedging osteotomy with internal fixation of both the fracture and the osteotomy is presented.

Forty-five cases of intracapsular fracture treated by primary osteotomy at Minneapolis General Hospital from October 1, 1946 to September, 1948, are analyzed.

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Discussion

DR. A. ZIEROLD.—Gentlemen, this is a rather formidable paper to discuss. It involves so many things that I can do no more than call attention to some points that seem deserving of further discussion.

I am familiar with the background of this paper inasmuch as it was developed on a fracture service with which I have been associated for several years. At the Minneapolis General Hospital during the past twenty years, we believe that we have followed a progressive course in the treatment of fractures of the hip. A few years ago, however, a careful analysis of the cases that were followed for two to three years showed our progress to be more apparent than real. It is in part in response to these findings that Dr. Nelson has interested himself in improving the methods and, consequently, the results. The method which he describes is by far the most successful and reasonable method that I have had the opportunity of examining.

The moving pictures were beautifully made, but I fear that they create something of an illusion. The operation is not as easy as the pictures would lead you to believe. While I am satisfied that this procedure is sound and effective, I am equally satisfied that it is not a procedure to be undertaken by the occasional operator. This is an operation for a surgeon.

I believe that Dr. Nelson has been too modest in analyzing his results. It should be remembered that the material with which this paper deals is of the poorest quality. The age level is high and for the most part, these patients are poor surgical risks. Furthermore, you will note from Dr. Nelson's classifications that he has taken the most difficult angle of fracture to treat. I believe that this procedure could be presented in a much better light with patients that more nearly represent the average than those which make up his series.

The mortality figures are arranged in a somewhat unfavorable light and I do not believe that they truly represent the situation. The mortality figures of a procedure should be restricted to hospital deaths only. Dr. Nelson has made no effort to compare this method with others, either favorably or unfavorably, and I

do not believe that it is the function of the discussion to do so. In considering all of the data presented here in this short time, I would be prepared to accept Dr. Nelson's ideas without reservation. I believe that he is to be congratulated in not only the manner in which he has presented the case, but most of all for its development.

DR. JOHN H. MOE.—I enjoyed Dr. Nelson's paper. It is hard to know what to say about the treatment of intracapsular hip fracture. I find from experience that no matter how you do it, it is tough going. My personal experience with the primary osteotomy for intracapsular hip fractures is as follows, and you can gather from this that I am not doing the procedure any more: I used the wedge osteotomy with internal fixation twice in 1944. I did two in 1946 and six in 1947. I chose to stop doing primary osteotomies as I felt that advancements in the treatment of hip fractures were becoming prevalent throughout the country and that the results of internal fixation were getting better than in former years.

I have analyzed 100 intracapsular fractures done between 1940 and 1945. Of these, nine were impacted fractures. Excluding these, there were sixty-four that could be analyzed at the end of five years. There were 62.5 per cent of excellent results, and I used essentially the same criteria that Dr. Nelson has outlined in rating the cases. There was aseptic necrosis in 28 per cent and nonunion without aseptic necrosis in 18 per cent. I felt at that time that this was an unsatisfactory result and that is why I suggested the primary osteotomy in an attempt to obtain a better result. Since 1945, there have been some very definite opinions brought forth as to what constitutes a satisfactory reduction, and it has been my experience that when these principles are strictly adhered to that the results are definitely better, so that at the present time I feel that the percentage of non-unions that can be expected in ordinary internal fixation of a fracture of the neck is less than the percentage that Dr. Nelson has shown occurs following a primary osteotomy. Very few, if any, of the primary osteotomies have normal hip function, so I feel that the osteotomy should be reserved for those cases which are showing delayed union. The insertion of a bone graft will also lessen the need of the osteotomy in the treatment of delayed or nonunion of the fracture.

I wish to make mention of a recent article by Dr. John Spikoff of Denmark. In a large series of intracapsular hip fractures there were 86 per cent healed and 33 per cent of aseptic necrosis. The percentage of aseptic necrosis seemed to be in direct proportion to the displacement of the fracture, and he found that with marked displacement of the fracture, aseptic necrosis occurred in 69 per cent. In impacted fractures, there was an extremely small percentage of aseptic necrosis. Furthermore, he found no difference in healing between the so-called vertical fractures and the transverse neck fracture. In other words, Pauwels classification did not apparently have any prognostic value as to the healing in this series. Furthermore, he treated 50 patients personally between 1941 and 1943, and 94 per cent of these healed and 6 per cent had a pseudoarthrosis and 16 per cent an aseptic necrosis. I personally feel that our efforts should be directed toward getting a better anatomical reduction and an overcorrection into an abducted position rather than to do the primary osteotomy. In my experience, Pauwels group 3 and 4—that is, the so-called vertical fracture—heal just as well when properly reduced as any other kind of fracture. Therefore, this in my opinion is not a criterion for doing a primary osteotomy.

Question: What method do you use to get good results?

Answer: Based on my observation, I'm getting better results since 1945, and I think it is because I am

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reducing fractures anatomically and impacting them into an abducted position and internally fixing with wires which go as vertically as possible, starting low and going up into the head, particularly following the inferior and posterior portion of the neck and head. I do not feel that wires offer any better solution to the problem of internal fixation than a Smith-Peterson nail, but in my experience the use of the Moore pins or wires is easier. It should also be mentioned that the heavier Moore pins are used now rather than the old thin ones.

DR. RALEH T. KNIGHT.—The most important thing about the anesthesia for these old patients with fracture of the hip is to give as little anesthetic as possible. No anesthetic should be given while the patient is in shock. Unless and until the shock is successfully treated, no anesthetic should be administered and no operation should be performed.

Low spinal anesthesia with a small dose is good if the patient can be turned for the puncture without too much pain and injury. If he is too restless and uncomfortable under the spinal a very little sodium pentothal should be given.

A well-done local anesthesia, especially if the capsule is intact enough to hold 25 c.c. or more of solution, works very well.

Probably the best anesthetic is sodium pentothal with d tubocurarine, 3 mgms. of the latter with each 100 mgms. of the former, the very smallest possible dose being given to keep the patient fairly quiet. In a recent case only 175 mgm. of sodium pentothal and 5.25 mgm. of curare were used. A tracheal tube had to be inserted to aspirate a large quantity of bronchiectatic secretion. The patient was talking as we lifted her from the table.

The most important consideration is to give the smallest possible dose of anesthetic.

DR. EARL C. HENRIKSON.—I have enjoyed this paper very much.

About ten years ago, as my inaugural thesis before this Society, I presented a study of 100 patients with intracapsular fractures of the hip, treated between 1930 and 1936 when internal fixation was first used at General Hospital in place of the Whitman cast method of treatment, showing a drop in mortality each year from 50 per cent previously to 0 per cent in about 1936. Since then the mortality has varied from year to year between 5 and 10 per cent. The improvement in the mortality rate in these cases was attributed in part to the use of internal fixation and in part to the fact that these fractures were treated as emergencies and operated upon immediately rather than after a waiting period during which complications might develop. In that series and in other series published around 1940 the percentage of unions ran quite uniformly around 85 per cent. Dr. Zierold has brought out the fact that in spite of the many different methods of treating intracapsular fractures the percentage of those uniting has not been improved much if at all. The type not uniting, in spite of what has been done to internally fix them, are the subcapitate type and those with the fracture line vertical or close to vertical. Emphasis should be placed on the fact that in Dr. Nelson's series of patients only those whom we would ordinarily expect might go on to non-union were selected for their primary osteotomy with plate fixation, yet the results show unions in just as high a percentage as in the average run of cases. In other words, Dr. Nelson et al have obtained essentially the same percentage of unions in patients in whom we would ordinarily see no union.

DR. R. E. HULTKRANS.—How long do you wait after the fracture before doing an open reduction or primary osteotomy? I do not believe that this time factor was mentioned in the essay.

DR. EDWIN G. BENJAMIN.—Could you give something on the comparative results between this treatment and some of the other newer methods?

Can any other method of fixation be used or is the Moe plate the most satisfactory?

DR. M. C. NELSON (in conclusion).—In answer to the question about the effect of delay before operating on the mortality rate, no statistics are available. At one time we delayed a long time and the results were not good. Then we went to the other extreme and operated as an emergency procedure and had disconcerting results. Now we have taken more the middle road. Each patient is carefully evaluated as to cardiac status, kidney function, etc., before operation. It is my impression that our mortality rate decreased after adoption of this policy.

Dr. Moe brings out a point which is being stressed more and more in the literature. This is that more attention is being given to the high incidence of aseptic necrosis of the femoral head rather than to non-union of the fracture. The reason for the generally lower incidence of non-union I believe is that men are realizing that anatomical reduction or reduction in abduction—with the head fragment more or less on top of the neck—is a necessary prerequisite to stable internal fixation.

I am glad to say Dr. Knight, that we have no argument about anesthesia in these elderly patients. We put the patient to sleep with pentothal but depend on local infiltration novocaine for our anesthesia. Curare is not used at all and usually only about a half gram of pentothal. We do not mind a little movement on the part of the patient.

In answer to Dr. Benjamin, Dr. John Moore of Philadelphia, in 1948, described a procedure similar to the Brackett operation. The head of the femur is removed and drilled out until nothing is left but cartilage and a thin shell of bone. The stump of the neck is then rounded off and the cartilage cap fitted to it. It is essentially a cartilage cup rather than a vitallium cup arthroplasty.

For the average fracture—ones with a fracture angle of less than fifty degrees—we use a Smith-Peterson nail but first we must have an absolutely satisfactory reduction; by this I mean anatomical reposition of the fragments or with the head fragment in abduction. If we are unable to obtain perfect reduction, I favor an immediate or primary McMurray or Leadbetter type of osteotomy rather than an open joint operation.

ALBERT T. HAYS, M.D.
Recorder

The discovery of unsuspected tuberculosis among the patient population of the general hospital represents case finding under particularly favorable conditions. All such persons have already elected to become patients. It is far easier under such circumstances to obtain the co-operation of the individual and of his family. The door is open for extension of the survey to relatives, friends and known prior contracts. Isolation and treatment can be started without delay.

All of the facilities for collateral diagnosis are readily at hand. The all-important step of substantiating miniature chest findings with those obtained on the basis of more extensive x-ray examinations can be carried out with dispatch and without the danger of losing contact with the individual, which often presents a serious problem in surveys conducted among large groups of supposedly normal individuals.—FRED J. HODGES, M.D., *Journal, Michigan State Medical Society*, November 1949.

Minnesota Academy of Medicine

MEETING OF FEBRUARY 14, 1951

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, February 14, 1951. Dinner was served at 7 o'clock and the meeting was called to order at 8:25 p.m. by the President, Dr. W. H. Hengstler.

There were thirty-seven members and four guests present.

Minutes of the January meeting were read and approved.

Following a short business session, the scientific program was presented.

HEARING LOSS

LAWRENCE R. BOIES, M.D.

Minneapolis, Minnesota

You are aware of the fact that the character of otologic practice has changed in recent years. Beginning in about 1937, the use of the sulfonamides brought a decrease in the incidence of acute suppurations of the middle ear and of the complications of these infections. Today, we rarely do a myringotomy and more rarely an operation for acute mastoiditis. Because of this, it might seem that the practice of otology has become a specialty of more limited activity. However, the opposite is true. Probably the change in the character of the otologist's practice has focused his energies on hitherto neglected aspects of otology. In addition, advances in the means of assessing otologic function have made changes in the therapy and rehabilitation of disorders of hearing.

Today, in spite of a marked reduction in the incidence of acute suppurations and the complications of this disorder, we are seeing numerous cases of a hearing loss of the conduction type due to disorders involving the middle ear.

Chronic secretory otitis media, in which an exudate or transudate occurs in the middle ear, is common, particularly in children. The basic mechanism in the production of this is apparently a closure of the eustachian tube. Lymphoid tissue in the form of adenoid structures is often the site of infection which involves this tube. Congestion in the tube due to allergic reaction is another factor. Faulty pneumatization of the mastoid because of certain middle ear conditions developing at birth or infections or irritations in the tube in early infancy may be another important factor.

Irradiation of the nasopharynx with radium or x-ray has been widely heralded. It is my opinion that irradiation is not the panacea that the enthusiasts for it would lead us to believe. Many of the reports indicating good results from its use are not convincing because they lack adequate controls or the condition being treated is not clearly defined. There is a limited use for this treatment.

Otosclerosis is a common cause of hearing loss. Rou-

tine studies of temporal bones in cases in which hearing loss is not a problem would indicate that the existence of otosclerotic foci is common in the white rat and more common in the female sex. We use the term "clinical otosclerosis" for those cases in which an otosclerotic focus causes hearing loss. In the event that the hearing loss from clinical otosclerosis remains conductive there is a chance that the hearing can be restored to a serviceable level by the fenestration operation. This involves by-passing the stapes fixed in the oval window by creating a window in the amputated end of the horizontal semicircular canal. To date, the biggest obstacle to a permanent result from the creation of this window is the tendency for this opening to close. However, improvements in technique have raised the percentage of success. Today, I would estimate that in the ideal case in which the operation is skillfully performed there is about a 60 per cent chance of a permanent result.

In spite of the fact that there is little work in the matter of acute suppurations of the middle ear and its complications, the otologist is still seeing considerable chronic suppurative otitis media. Some of these cases are hangovers from severe middle ear infections complicating scarlet fever or measles in childhood. In time, we will run out of these because the dwindling cases of these disorders have their complications controlled. However, there are the cases of chronic middle ear suppurations resulting from an infection occurring in the middle ear in which mastoid pneumatization has been disturbed in early infancy. Once infection has gained a start in these cases, these seem to be destined to more or less chronicity and are not affected permanently by the sulfonamides or antibiotics, probably because of the relatively poor blood supply of the middle ear mucosa in these cases. Also, there are the cases of limited chronic suppuration in the attic of the middle ear which are apparently due to invagination of Shrapnell's membrane from prolonged negative pressure in the middle ear from eustachian tube occlusion. These are apparently unaffected by the sulfonamides or antibiotics.

Perceptive hearing loss is not amenable to treatment.

The presentation of this paper was accompanied by lantern slides.

JUNE, 1951

Our hope for this type lies in prevention. Damage of the nerve of hearing or the neural mechanism in the organ of Corti occurs from infections, drugs, trauma, et cetera. The first is being controlled. The second when recognized should be controlled. Acoustic trauma from noise is everywhere a possibility. This fact is becoming recognized. Prevention lies in protecting human ears from exposure to loud sounds or concussion by the avoidance of this exposure or protection by the use of defenders placed in the external ear.

Discussion

DR. KENNETH A. PHELPS, Minneapolis: Dr. Boies' excellent talk brings out many of the changes that have occurred in otology during the past twenty years. His chart showing the control of acute otitis media and the elimination of acute surgical mastoiditis is very interesting. That may be one reason why the ear surgeon is now developing operations for deafness rather than for infection. Dr. Boies explained the fenestration operation which is done for otosclerosis, and he is to be compli-

mented on his work in this field. We all hope that some successful treatment will be developed for other types of deafness as well.

DR. CARL B. DRAKE, Saint Paul: Recently I saw some statistics to the effect that twenty years ago mastoidectomy was the third in the list of operations in frequency. Tonsillectomy came first and appendectomy second. With the advent of sulfa drugs, ear infections have been so well controlled that mastoidectomy is seldom required.

DR. ROBERT PRIEST, Minneapolis: I enjoyed the presentation and certainly Dr. Boies has given us a very good summary in this field. I have admired his attack on the problem of fenestration over a number of years. Quite a while ago I saw a mimeographed form which Dr. Boies gives to his prospective operative patients. This presents the pros and cons of the procedure, and there were more cons on the page than pros; and still the patients come back for operation. This is indeed a forthright and honest manner of handling the problem, which of course is no surprise to those of us who know him well and have studied under him.

SLOW RESPONSE TO PREOPERATIVE ANTITHYROID THERAPY IN SEVERE HYPERTHYROIDISM

Report of Two Cases

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The purpose of this thesis is to report and discuss two cases of hyperthyroidism showing a delayed response to the present methods of preoperative preparation. In each of these cases the principal antithyroid drug administered was propylthiouracil. A detailed account of the pharmacology and toxicity of propylthiouracil is not a part of this report. However, the application of the drug and the expected clinical response of the patient to propylthiouracil, when used in cases of hyperthyroidism, are worthy of comment.

By blocking the production of thyroxin, propylthiouracil is capable of reducing to normal the elevated basal metabolic rate of hyperthyroidism resulting from either primary hyperthyroidism or adenomatous goiter. With the fall in the basal metabolic rate there is a gradual amelioration of all signs and symptoms of hyperthyroidism except those of the eye.

Lahey and Bartels⁵ state that in their experience there has been no patient in whom they have failed to bring the metabolic rate to normal if one of the drugs in the thiourea group is administered in a large enough dose over a long enough period of time, and provided they were not compelled to discontinue it because of a complication.

According to Bartels,¹ it was not until the daily dose had been increased to 200 mg. that uniformly satisfactory improvement was accomplished in all cases. Larger doses, up to 600 mg. a day, have been used in a few cases without a significant difference in the clinical response to that obtained with 200 mg. For patients

with large adenomatous goiters, whose response to therapy is always slow, a daily dose of 300 mg. is given.

It is important to be able to estimate with reasonable accuracy when the patient being treated with propylthiouracil will reach a euthyroid state and be ready for thyroidectomy. Lahey and Bartels⁵ find that the time required to bring the elevated basal metabolic rate to normal is determined from the following factors: the type of thyroid disease, primary hyperthyroidism or adenomatous goiter, the duration of the disease, and whether or not iodine had been taken previously. Patients with primary hyperthyroidism who have had the disease nine months or less and have not taken iodine have an estimated daily drop of 1.3 per cent in the basal metabolic rate. If iodine had previously been taken, the drop is 1 per cent each day. If the hyperthyroidism is over one year in duration, irrespective of iodine administration, the drop is 1 per cent each day. Patients having adenomatous goiter with hyperthyroidism, particularly those who have been treated with iodine before preoperative preparation, require a much longer period of time to restore the basal metabolic rate to normal because these glands, with their large storage of thyroxin-laden colloid, have greater reserves of thyroxin. In this type there will be a drop in the basal metabolic rate of approximately .5 per cent each day. In 660 cases the longest time Lahey and Bartels⁵ have given the thiourea agents to bring the metabolism to normal was 180 days in a patient with a large, toxic adenomatous goiter who had been receiving iodine for a long period of time before preparation for thyroidectomy.

Inaugural thesis.

Bartels² found that the combined use of Lugol's solution with propylthiouracil from the onset of therapy in patients with primary hyperthyroidism has delayed the ultimate reduction of the basal metabolic rate. The average drop in the basal metabolic rate with combined therapy is established as 1 per cent and .8 per cent as compared with 1.3 per cent and 1 per cent, respectively, in patients with hyperthyroidism of short duration and those with longstanding hyperthyroidism.

With these facts in mind, the following case reports are of interest because there is a delayed response to propylthiouracil in one and a stubborn resistance to the drug in the other case. The first patient reached what was considered to be maximum improvement after fifteen months of preoperative preparation. She died post-operatively in what was thought to be a thyroid crisis. The second patient resisted propylthiouracil therapy for six months and at the end of one year was finally brought to a satisfactory preoperative condition by the additional administration of radioactive I¹³¹. This patient made an uneventful recovery after thyroidectomy.

Since radioactive iodine was used in the second case, a brief summary of the action of this isotope is indicated. Means⁶ and others working in the field of radioactive therapy believe the therapeutic effect of I¹³¹, which has a half-life of eight days, is due to a destructive action on the parenchymal cells of thyroid tissue. Radioactive iodine emits beta and gamma rays. The therapeutic effect is due chiefly to the beta rays which have a penetrating power of only a few millimeters. I¹³¹ gives off its total radiation in forty-eight to fifty-six days. Three to four months are allowed for the maximum clinical effect. Chapman, Skanse, and Evans³ have shown that the average retained dose in patients with hyperthyroidism is .142 millicurie per estimated gram of thyroid tissue; 97 per cent of this dose is delivered in thirty days. The dosage of this isotope has been slowly increased from 4 to between 8 to 14 millicuries. According to Werner, Quimby, and Schmidt,⁷ the sum of the thyroid uptake, as measured by means of the Geiger counter, and urinary excretion of I¹³¹ in twenty-four hours never represents 100 per cent of the administered material, but varies from 70 to 85 per cent of this, the remainder being distributed in smaller concentration in the blood and certain other organs. Thus, when the urinary output is low, the thyroid uptake is high, but the quantitative inverse ratio is not exactly proportional. These authors found that in normal persons the gland uptake in twenty-four hours was between 15 and 30 per cent of an administered tracer dose. In patients with toxic diffuse goiter the uptake was from 44 to 76 per cent. Radioactive iodine is successful in controlling symptoms of hyperthyroidism in 90 per cent of the cases. The problem in this type of therapy is to select a dosage that will not induce permanent hypothyroidism.

Case 1.—A white woman, sixty-four years of age, was first admitted to the Minneapolis General Hospital on January 27, 1947. The present illness began twenty years ago when a physician discovered an enlargement of the thyroid gland and advised thyroidectomy. The patient refused operation at that time because her symp-

toms were minimal. About six years ago the goiter began to grow and she complained of nervousness. From that date to the present she noted the gradual development of the following symptoms: enlargement of her neck, nervousness, tremor of the hands, excessive appetite, sweating, palpitation, shortness of breath, choking spells, and a weight loss of 30 pounds. For the past two years the symptoms progressed, becoming much worse during the past three months. In all other respects her past health has been good. The patient had taken Lugol's solution for a short period of time three years ago.

Physical examination revealed a nervous, agitated, apprehensive, and emotional individual. She had a visible tremor of the hands and fingers. She picked at the bed clothes. There was a diffuse nodular enlargement of the thyroid gland with a greater enlargement of the left lobe, suggesting an intrathoracic extension with displacement of the trachea to the right. A soft systolic bruit was heard over the right lobe. The eyes did not protrude but there was a staring expression present. The pulse rate ranged between 110 and 120. The blood pressure was 156/60. She weighed 95 pounds. Other physical findings were normal.

The initial basal metabolic rates ranged between +32 and +41 per cent. The urinalysis, routine blood, and serological studies were negative. The blood cholesterol was 107 mg. per cent. Roentgenograms of the neck and chest revealed a displacement of the trachea to the right and normal lung fields. The electrocardiogram revealed a left axis deviation and myocardial damage. The diagnosis was toxic nodular goiter.

On February 4, 1947, the patient was given thiouracil, .6 gm. daily. At the end of a week the drug was discontinued because a skin rash appeared. She was then given Lugol's solution, 30 drops daily. After a month of rest in the hospital there was only slight improvement in her condition. She was discharged from the hospital on February 24, 1947. The patient was advised to take 30 drops of Lugol's solution daily and report to the out-patient clinic each week.

On April 3, 1947, the patient was readmitted to the hospital with persistent symptoms of hyperthyroidism after taking Lugol's solution for a period of six weeks. She was still very nervous and agitated. Several basal metabolic rates ranged from +31 to +46 per cent. The pulse ranged between 95 and 100. Her weight was 96 pounds, revealing essentially no gain in weight. On April 24, 1947, she was given propylthiouracil, 150 mg. daily in addition to the 30 drops of Lugol's solution daily. On June 9, 1947, the propylthiouracil was increased to 200 mg. daily. Lugol's solution was discontinued on July 22, 1947. In August, 1947, several basal metabolic rates were obtained ranging from +10 to +15 per cent. The pulse ranged between 85 to 90. The patient's maximum weight at this time was 104 pounds, a gain of approximately 10 pounds. Although the patient had greatly improved, it was the opinion of the medical and surgical staffs that she had not reached a normal state. She was discharged from the hospital August 27, 1947, taking 200 mg. of propylthiouracil daily.

In the out-patient clinic during the next three months several basal metabolic rates ranged from +10 to +24 per cent. The last of November, 1947, the metabolism was +14 per cent. On February 16, 1948, the reading was +10 and +3 per cent, and the weight was 114 pounds, a total gain of approximately 20 pounds. The pulse ranged between 70 and 85. On February 24, 1948, the patient was readmitted to the hospital for thyroidectomy. Her only complaints were fatigue, shortness of breath, and palpitation on exertion. Electrocardiogram revealed an occasional auricular extrasystole, left axis deviation, although the tracing was considered to be within normal limits. Roentgenograms of the heart revealed no enlargement and no evidence of pulmonary

pathology. The displacement of the trachea to the right was again noted. In addition to the propylthiouracil, 15 drops of Lugol's solution daily was administered for three weeks prior to operation. Figure 1 shows the course of the basal metabolic rate, pulse, and weight

the respirations were 28. An emergency electrocardiogram revealed a sinus tachycardia. Suddenly, eight hours after operation, the pulse became weak and irregular, the blood pressure dropped, and the patient expired in what appeared to be a thyroid crisis initiated

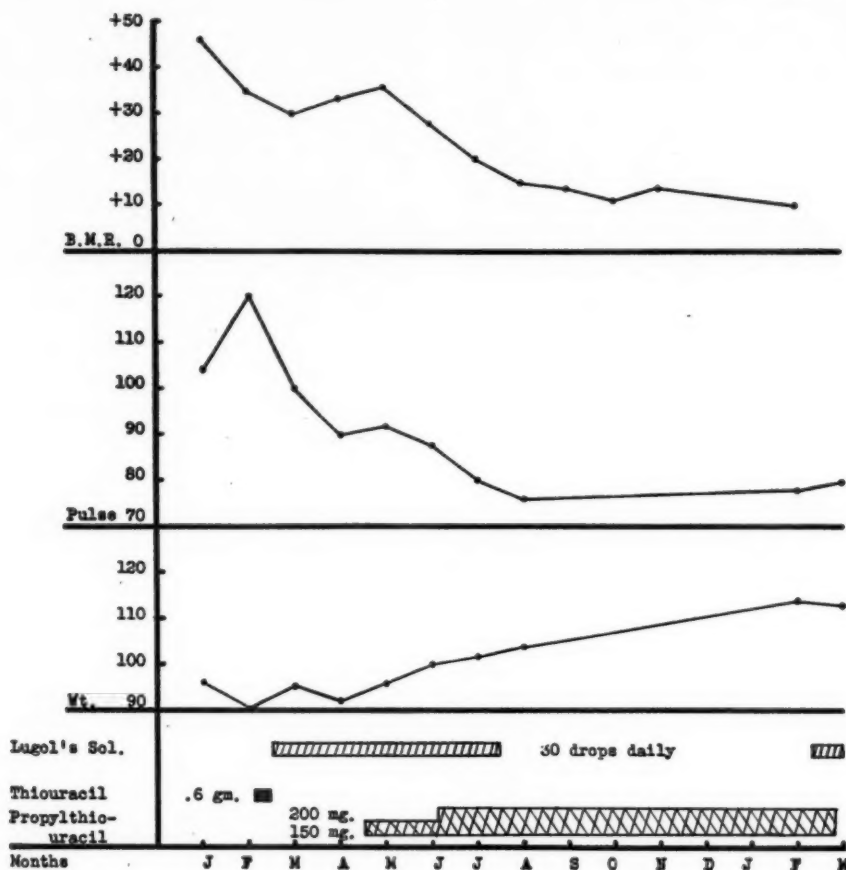


Fig. 1. Preoperative course of the first patient.

during the fifteen months of preoperative preparation. Figure 2 shows a photograph and the facial expression of the patient taken in March, 1948, a few days before operation.

On March 9, 1948, subtotal thyroidectomy was performed by the attending and resident staff of the Minneapolis General Hospital. The anesthetic was pentothal, curare, and endotracheal nitrous oxide and oxygen. The procedure was long and difficult due to troublesome bleeding encountered in removing the large sub-sternal portion of the left lobe. The pulse rose from 112 to about 200 and then dropped to between 140 and 160, where it remained throughout most of the procedure. There was a fall in blood pressure due to excessive blood loss. A transfusion of 1,500 c.c. of blood was administered during and after the surgical procedure. Postoperatively the patient was given oxygen continuously, morphine for restlessness, and intravenous sodium iodide. The patient failed to regain consciousness. The skin was hot, the temperature rose to 104.3°, the pulse continued to range between 140 to 152, and

during surgery. Since an autopsy was not obtained, the cause of death was not absolutely accurate.

The surgical specimen consisted of two pieces of thyroid tissue weighing 155 gm. The gross appearance was that of multiple, large and small adenomas. Microscopically there were large cystic glands filled with colloid. Occasionally there were papillary enfoldings into the cystic glands. The diagnosis was thyroid adenomas of the cystic colloid type.

Discussion.—In this case approximately ten months were required for propylthiouracil to lower the basal metabolic rate to normal and make the patient a satisfactory risk for thyroidectomy. The average estimated time necessary to lower the basal metabolic rate in adenomatous goiter with an initial rate of +40 per cent should have been about three months. It is entirely probable that the long-standing effect of hyperthyroidism

delayed the therapeutic action of propylthiouracil. The drug will abolish the synthesis of thyroxin but will have no effect whatever on the thyroxin which is synthesized and stored.

The sudden postoperative death in a patient that seemed adequately prepared was somewhat startling. Without an autopsy one cannot be certain that the patient died in a thyroid crisis. However, to the clinicians in charge of the case, it appeared to be the probable cause of death, and it was listed as such on the record. The length of the operation, the trauma necessary to control the troublesome hemorrhage, and the difficulty encountered in delivering the large substernal left lobe might have liberated sufficient thyroxin to produce such a reaction. Before the days of adequate antithyroid preparation, Lahey⁴ believed that severe postoperative reactions were a result of too much surgery. He advocated stage operations in the poor-risk patient. In this patient the surgeons were warned of trouble ahead when the pulse rose to 200 and then fell to remain between 140 and 160 throughout the procedure. A death might have been avoided if the operation could have been stopped. However, with the present methods of preoperative preparation one never anticipates a postoperative thyroid crisis.

Case 2.—A thirty-eight-year-old male truck driver was first admitted to the Minneapolis Veterans Hospital on July 16, 1947. The present illness began in 1945 while in the service, when he noticed a shakiness of his hands. Since November, 1946, the patient had been in poor health. During the past eight months he noticed nervousness, restlessness at night, increased tremor of his hands, sweating, weakness, increased appetite, loss of weight, and diarrhea. He ate six meals a day but lost 35 pounds during the last seven months. The patient noticed that he had lost strength and could not lift the heavier boxes at work. He had diarrhea for four months, having four to eight loose stools each day. The patient thought his eyes were more prominent during the past month. His mother thought he had had a visible goiter for several months. He stopped work on July 14, 1947, and consulted his local physician, who told him he had a toxic goiter. His doctor referred him to the Veterans Hospital for treatment. He had never taken iodine in any form.

Physical examination on admission revealed a well-developed, but thin, chronically ill, activated, white male. His movements were quick. There was a fine tremor of the hands and quivering of the body. The skin was warm and moist. A staring expression of the eyes was present, but he had no apparent exophthalmos. There was visible enlargement of the neck which by palpation revealed a moderate bilateral enlargement of the thyroid gland. There was a systolic bruit and a thrill over the left superior pole. The blood pressure was 154/78, the pulse 142, and the weight 113 pounds. General muscle weakness was present. No other abnormal physical findings were noted.

Laboratory findings revealed an initial basal metabolic rate of +67 per cent. The blood cholesterol was 135 mg. per cent. The hemoglobin was 91 per cent, the white blood count was normal except for a relative lymphocytosis of 35 per cent. The urinalysis showed a trace of albumin with occasional white blood cells and



Fig. 2. Preoperative photograph of the first patient.

granular and hyaline casts. At a later date these urinary findings disappeared, and the phenolsulfonphthalein test was normal. The electrocardiogram showed a sinus tachycardia. The roentgenogram of the chest was normal. There was no evidence of cardiac enlargement or tracheal displacement. Lateral roentgenograms of the neck revealed a minimal depression of the anterior surface of the trachea probably by an enlarged thyroid gland. The diagnosis was diffuse hyperplastic goiter (Grave's disease) with thyroid toxicosis.

On July 22, 1947, the following therapy was administered: propylthiouracil, 200 mg. daily, Lugol's solution, 30 drops daily, phenobarbital sedation, and a diet with a caloric intake of approximately 5,000 calories a day, supplemented with a high vitamin intake.

On August 21, 1947, the patient had shown slight improvement as compared to his severely toxic condition on admission. The blood pressure was 135/64. The pulse ranged between 100 and 120. The basal metabolic rates ranged between +40 and +50 per cent. The weight was 134 pounds. The thyroid gland seemed considerably larger than it was on admission and the neck had increased in size from 15 to 17 inches. On August 23, 1947, the propylthiouracil was increased to 400 mg. daily and the same dosage of Lugol's solution was continued.

On October 10, 1947, Lugol's solution was discontinued because, except for a gain in weight, there was very little objective evidence of improvement from the combined antithyroid therapy. On November 25, 1947, the patient weighed 126 pounds. The basal metabolic rate ranged between +50 and +60 per cent. The pulse ranged between 90 and 120. The gland was smaller and more firm and the neck size was 15½ inches. It appeared that the patient had not improved and might even have slipped slightly.

Due to the unsatisfactory response to propylthiouracil over a period of six months, the medical staff concluded that this patient would be a satisfactory candidate for radioactive iodine as soon as it could be obtained from the Oak Ridge, Tennessee, plant. On January 29, 1948, propylthiouracil was discontinued. The estimated weight of the thyroid gland was 50 gm. The following day the patient received 7 millicuries of I¹³¹ at the University

*Case 2 is published with permission of the Chief Medical Director, Department of Medicine and Surgery, Veterans Administration, who assumes no responsibility for the opinions expressed or conclusions drawn by the author.

MINNESOTA ACADEMY OF MEDICINE

Hospital under the supervision of Dr. Howard Horns. A check of the amount of radioactivity over the gland revealed the patient had taken up approximately 4.5 millicuries of radioactive iodine. Dr. Horns thought this amount would produce a satisfactory response. On

signs of hyperthyroidism remained. The patient was nervous, underweight, and weak. There was a tremor of the hands and a moist skin. Although the gland had diminished in size, there was still a loud bruit over the left upper pole. Thyroidectomy was advised at this

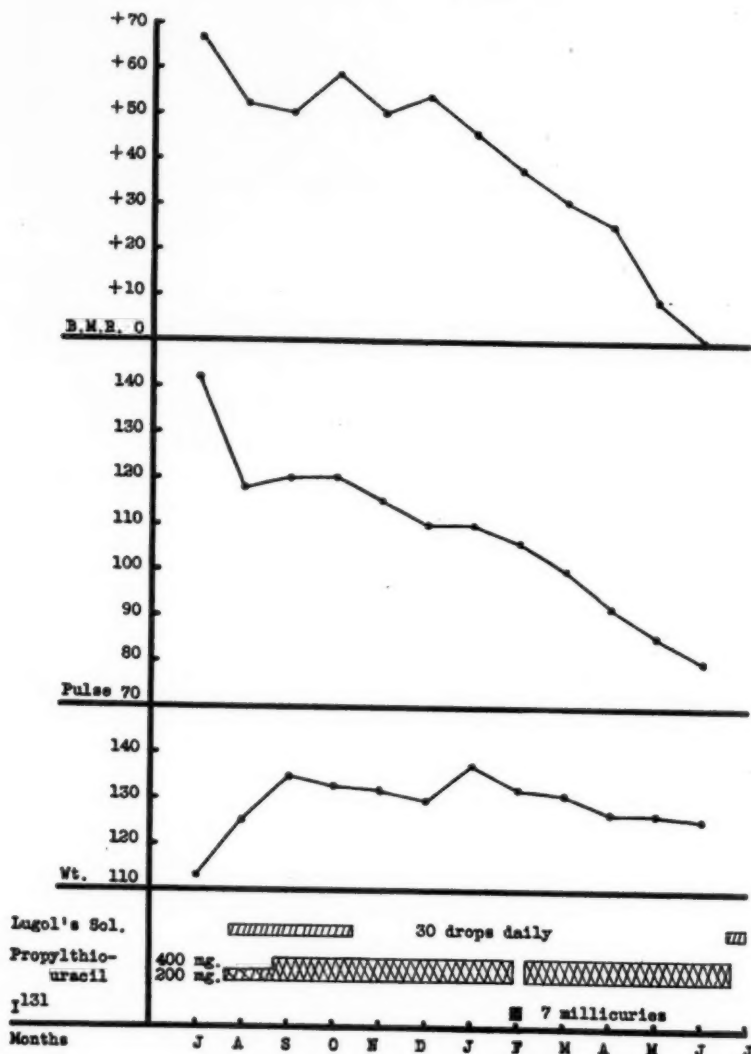


Fig. 3. Preoperative course of the second patient.

February 3, 1948, propylthiouracil was again administered in a dose of 400 mg. daily. On February 29, 1948, the patient was given a furlough at home with weekly hospital interviews. Prior to the furlough his pulse ranged between 90 and 110. His weight was 130 pounds. The basal metabolic rate ranged between +30 and +35 per cent. The size of the gland continued to decrease and the patient showed a definite improvement.

During the next four months the patient continued to improve. By June, 1948, the basal metabolic rate ranged between zero and +15 per cent. The pulse ranged between 70 and 90. The weight was 130 pounds. It was the opinion of the medical staff that a few clinical

time, and it was believed that the preoperative preparation was adequate. Propylthiouracil was discontinued on June 20, 1948, and Lugol's solution administered for ten days prior to operation. Figure 3 shows the course of the basal metabolic rate, pulse, and weight during the period of preoperative preparation.

On June 30, 1948, subtotal thyroidectomy was performed by the author, without incident in a comparatively dry field. Grossly the gland appeared to be partially involuted. One hundred and forty grams of tissue were removed. The pathologist's report was diffuse hyperplastic goiter with evidence of iodine involution. One small portion of the gland revealed evidence

of a colloid adenoma of the thyroid. Very small thyroid remnants were left on each side. Postoperatively the patient's convalescence was uneventful. On July 12, 1948, the basal metabolic rate was 0 per cent prior to his discharge from the hospital.

The patient was recalled on September 21, 1948, for examination. He felt well, noticing only slight sweating of the palms of his hands on occasions. The basal metabolic rate was +7 per cent. He was recalled again on December 23, 1948. He had been entirely asymptomatic; however, he seemed to fatigue a little more easily than prior to his illness. The basal metabolic rate was -9 per cent. The blood pressure and pulse were normal. His weight was 136 pounds, approximately 10 pounds under his normal weight.

Discussion.—In a patient with primary hyperthyroidism the estimated time for a basal metabolic rate of +67 per cent to return to normal is approximately two and one-half to three months. It is difficult to explain why this patient showed so little clinical improvement during the first six months of propylthiouracil therapy. Just how long resistance to therapy would have continued is not known. Even though the administration of propylthiouracil was resumed after the radioactive iodine was taken, it was probably the radioactive iodine, rather than the propylthiouracil, that produced the satisfactory preoperative clinical response. Noticeable improvement began soon after radioactive iodine was given. When propylthiouracil fails to improve the patient with severe hyperthyroidism, within a reasonable length of time, one has an additional effective agent in I^{131} that can be used preoperatively. No undesirable late effects or fibrosis of the gland occurred as a result of radioactive iodine therapy.

Conclusions

When propylthiouracil is used preoperatively in severe hyperthyroidism, a resistance to the drug or a delayed response may occur occasionally. Radioactive iodine is a valuable adjunct when used in the preoperative preparation of the patient resisting propylthiouracil therapy.

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Discussion

DR. S. R. MAXEINER, Minneapolis: I think this is a very timely and instructive presentation that Dr. MacKinnon has given us. His work at the Lahey Clinic has given him an excellent foundation.

There is still a great difference of opinion regarding the use of radioactive iodine. Some writers seem to feel that there will be no need for surgery and that the entire pathology can be controlled by radioactive substance. Other references in the literature, however, are not so positive and suggest that it might be necessary to follow radioactive iodine with surgery. Thirty or more years ago when I was with Dr. Farr, we operated on the mother of a Saint Paul doctor for a violent exophthalmic goiter. Those were the days before the use of iodine in any form, and this patient had the most violent reaction I have ever witnessed. Many of these extremely toxic thyroids were treated by the use of a metal syringe through which boiling water was injected into the substance of the thyroid gland. This seems a bit heroic but it was moderately effective.

When propylthiouracil was first put on the market, we used it on one case with inadequate dosage and over an inadequate length of time. The patient was operated upon in two stages and, after the first stage, was the most wildly delirious patient I have ever seen. Recently we operated upon a young man rejected by the army because of an exophthalmic goiter. He was treated with adequate doses of propylthiouracil and iodine, and subsequently his operation was performed with a minimal reaction. I still lean toward the use of propylthiouracil and iodine in appropriate doses over an adequate length of time as a preparatory treatment for surgery.

Radioactive iodine has been used in cases of malignancy of the thyroid to determine the presence of metastasis. After its injection the Geiger counter will frequently determine the presence and location, or absence of metastasis.

We have made one other observation which I think is worthy of mention, which is that patients who have been operated upon for exophthalmic goiter, and are apparently well, may have a violent thyroid reaction even years later after another operation. One patient whom I have in mind was operated upon by us several years previously and apparently cured of his exophthalmic goiter. Later I did a gastric resection for a peptic ulcer which was followed by a fatal thyroid crisis.

DR. CHARLES E. REA, Saint Paul: I enjoyed Dr. MacKinnon's paper very much. As with many other drugs, the more we know about propylthiouracil, the more we know about its limitations. With most patients it takes days to bring the metabolic rate to normal under propylthiouracil therapy, but with some patients, as Dr. MacKinnon's cases show, it takes a much longer time.

Regarding the treatment of hyperthyroidism, there are some questions I should like to ask. It is common practice to give a patient who has been treated by propylthiouracil a course of Lugol's therapy about ten days before operation. It is commonly said that this decreases the vascularity of the thyroid gland. I wonder if this is true. Is the vascularity of the thyroid gland specific or peculiar to it, and does the preoperative medication greatly influence the vascularity?

I recently had a patient with hyperplastic goiter who had been treated with propylthiouracil; ten days before operation I told her to take ten drops of Lugol's solution three times a day. She said she had taken iodine years ago when she was young. After operation I told her that I thought it would be a good idea if she continued the Lugol's solution for a while and she said, "How can I apply it through the dressing?" This was the first time that I found out she had been putting the Lugol's on the skin of her neck instead of taking it internally. Another patient could not tolerate iodine therapy and had been prepared with just propylthiouracil

before operation. It is interesting that, in both these cases, we were not impressed with vascularity of the gland at operation; also the microscopic section of these glands showed no increase in the number of the blood vessels or the diameter of the blood vessels as compared to (1) adenomatous thyroid with hyperthyroidism treated with Lugol's and (2) non-toxic cystic goiter which receives no preoperative medication.

Another thing I would like to discuss is the use of curare in patients who have hyperthyroidism. In hyperthyroidism, I do not believe there is much indication for using curare as part of the anesthesia. In fact, I should like to ask the anesthetists if patients who have a lymphatic hyperplasia may not be sensitive to curare. We know, for instance, that the patients with myasthenia gravis have an enlarged thymus. One of the therapeutic tests in the diagnosis of myasthenia gravis is the sensitivity to curare. In hyperthyroidism there may be an enlargement of the thymus and lymphatic hyperplasia. Recently I was asked to see a patient who had been well prepared with propylthiouracil and Lugol's solution, upon whom the surgeon was just starting to do a thyroidectomy with Baird's solution (pentothal, curare and nitrous oxide) as the anesthetic, when the patient went into collapse. Blood pressure and pulse could not be obtained until supportive therapy was given. I suggested they postpone the operation. Five days later the same procedure was performed without the curare and the operation was uneventful. Also, I have seen a patient with chronic lymphatic leukemia who developed an incarcerated right indirect inguinal hernia. While anesthesia was being induced with pentothal and curare, the patient went into a similar collapse state. I realize that the mechanism of action of curare in myasthenia gravis is located in the myoneural junction and that hyperthyroidism and chronic lymphatic leukemia themselves are serious conditions, but is there a tendency for patients with lymphatic hyperplasia to be sensitive to curare?

Dr. MacKinnon also brings out an interesting observation that patients with hyperthyroidism who are well prepared with propylthiouracil may still develop a thyroid crisis or storm. I should like to suggest the use of spinal anesthesia in such cases with the idea of blocking out the splanchnic nerves to the adrenals.

DR. MARTIN NORDLAND, Minneapolis: I wish to congratulate Dr. MacKinnon on his excellent presentation of a timely discussion. Enough time has elapsed since the introduction of the antithyroid drugs in 1943 to place an evaluation upon the use of thiouracil and its allies in the treatment of hyperthyroidism. In the past, surgery has been very satisfactory for the control of hyperthyroidism, in terms of clinical results. Nevertheless, an adequate medical management is still desirable for those selected patients for whom surgical intervention is contraindicated, or for those in whom a persistent hyperthyroidism remains even after an adequate thyroidectomy.

The antithyroid drugs were at first hailed as a panacea which would ultimately displace the surgical management of hyperthyroidism. Unfortunately, many of the profession have not yet learned that the pendulum soon swung, and that extreme caution has replaced the early acclaim. Clinically, it was widely recognized that the toxic effects of these drugs outweighed their potential value. Accumulated data has caused a more moderate outlook in the preoperative preparation of selected patients with hyperthyroidism. It has never been claimed that any anti-thyroid drug, including Lugol's solution, would bring about a permanent recession in hyperthyroidism. Intensive research by such authorities as Bartels, Williams, Curtis and Swenson has shown that the basic etiological factor which causes hyperthyroidism is the determining cause of recurrence or remission, and this factor is not affected by the antithyroid therapy.

It is my purpose in discussing this paper to emphasize

the fact that these drugs should be employed only in the cases with severe hyperthyroidism and to assert that these drugs should not be employed in preparation of patients with adenomas with only a moderate toxicity. I know of no disturbance that requires more judgment of the attending medical advisor than the management of the patient with severe hyperthyroidism. The cases reported by Dr. MacKinnon represent this group. Preoperative, painstaking care, as he has shown, is advisable in spite of time or expense required. However, the severely toxic cases represent only a small percentage of the patients coming for treatment for "goiter." The less toxic cases, and especially the ones with simple adenoma, should not be subjected to dangers of these drugs, the unnecessary long periods of preparation, or the danger of overlooking malignancy in the adenoma.

Swenson and Curtis have further called attention to the increased vascularity created in these nodules by these drugs. The resulting increase in size plus hemorrhage within, have greatly added to the risk of the operation.

The mortality of thyroid surgery in all theatres of surgery is only one-half of one per cent. Thorough research by such authorities as McCullagh, Curtis and others has caused them to conclude that a well-established preoperative management of patients with hyperthyroidism, followed by competent surgery, will remain the treatment of choice until an antithyroid drug which will have a risk less than that of the disease itself is synthesized.

DR. E. A. REGNIER, Minneapolis: I enjoyed Dr. MacKinnon's presentation very much. I have very little to add except to tell of two patients whom I have had occasion to operate upon in the last three months. These two patients somewhat resemble Dr. MacKinnon's cases. One was in the thirties and had had an operation for hyperthyroidism ten years previously. She was markedly decompensated. I sent her to an internist for about six months for preparation, and she was given iodine with no results. She was then given propylthiouracil and her response was very slow. The cardiac condition improved but not to the point where she was a good surgical risk. After six months of preparation, she took the operation without event. The other patient was one who had had previous therapy in the country and came to the city for operation. There were severe signs of hyperthyroidism. When she began to recover, her metabolism dropped from 68 per cent in two months down to 32 per cent, the pulse dropped to below 90 even on moderate exercise. She was operated upon and the thyroid gland showed almost complete involution and fibrosis, one lobe was much harder than the other. I believe that patients who have had previous hyperthyroidism and been prepared with iodine are much more refractory to propylthiouracil and it takes much longer to prepare them. It is difficult to tell just how much time it will take. I believe that unless the patient shows a toxic reaction to propylthiouracil, it is much safer to wait until clinical signs and basal metabolic rates are in accord. I have always felt that enlargement of the thyroid gland under propylthiouracil certainly was not a hyperplasia, and it must be due to vascular engorgement and broader capillary bed. It think that accounts for the increased size.

Regarding curare, I personally will not use curare on a patient who has a toxic myocardium. I think curare is a very dangerous drug in a damaged heart. I operate on all toxic thyroids under local anesthesia with just enough pentothal and enough oxygen to carry them in an unconscious state.

DR. MACKINNON (closing): Prior to the last ten years, the preoperative preparation of patients with hyperthyroidism was standardized and relatively simple.

(Continued on Page 611)

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To assure the patient of the necessary quantity of liquid and natural mucilloid expedient to the promotion of peristaltic movement, Metamucil is to be taken with a full glass of cool liquid and may be followed by another glass of liquid if indicated.

Metamucil, mixed with water, produces:

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METAMUCIL® is the highly refined mucilloid of *Plantago ovata* (50%), a seed of the psyllium group, combined with dextrose (50%) as a dispersing agent. G. D. Searle & Co., Chicago 80, Illinois.

SEARLE

RESEARCH IN THE SERVICE OF MEDICINE

♦ Reports and Announcements ♦

AMERICAN COLLEGE OF SURGEONS

The American College of Surgeons will hold its thirty-seventh annual Clinical Congress in San Francisco, November 5 to 9, 1951, with headquarters at the Fairmont Hotel and Civic Auditorium. The thirtieth annual Hospital Standardization Conference is scheduled to be held concurrently, with meetings in the Civic Auditorium, as a part of the Congress. The combined programs will include scientific and technical exhibits, color television, cine clinics, medical motion pictures, scientific sessions, panel discussions, conferences, symposia, official meetings, and forums. Several thousand surgeons and hospital representatives are expected to attend.

Dr. Arthur W. Allen of Boston is chairman of the Board of Regents of the College; Dr. Henry W. Cave of New York is president, Dr. Alton Ochsner of New Orleans is president-elect and will be installed as president on November 5; Dr. Paul R. Hawley of Chicago is the director. Dr. Emile Holman is chairman of the San Francisco Committee on Arrangements. The hospital conference program is in charge of Dr. Paul S. Ferguson, acting assistant director in charge of hospital standardization.

PAN-PACIFIC SURGICAL ASSOCIATION

The Fifth Congress of the Pan-Pacific Surgical Association will be held in Honolulu, Hawaii, from November 7 to 19. The scientific program, which will begin on November 12 and continue through November 16, will include sessions in all divisions of surgery, with papers presented by surgeons from the Pacific area countries.

In addition to attending the surgical conference, physicians may enjoy a delightful vacation in Hawaii and are urged to bring their families with them, with the assurance of luxurious accommodations.

Further information, as well as hotel and travel reservations, can be obtained from the Pan-Pacific Surgical Association, Suite 7, Young Hotel Building, Honolulu, Hawaii.

COURSE IN POSTGRADUATE GASTROENTEROLOGY

The National Gastroenterological Association has announced that its course in postgraduate gastroenterology will be given at the Drake Hotel in Chicago, Illinois, on September 20, 21 and 22.

This year the course will again be under the direction and co-chairmanship of Dr. Owen H. Wangensteen, professor of surgery of the University of Minnesota Medical School, who will serve as surgical co-ordinator, and Dr. I. Snapper, director of medical education of the Mt. Sinai Hospital, New York, who will serve as medical co-ordinator.

Dr. Wangensteen and Dr. Snapper will be assisted by a faculty selected from the medical schools in and around Chicago. Presentations will include the following subjects: diseases of the mouth, diseases of the esophagus, peptic ulcer diseases of the stomach, diseases of the pancreas, cholecystic disease, psychosomatic aspects of gastrointestinal disease, diseases of the liver, diseases of the colon and rectum, and other miscellaneous subjects.

For further information and enrollment, write to the National Gastroenterological Association, Department GSJ, 1819 Broadway, New York 23, New York.

MINNESOTA SOCIETY OF NEUROLOGY AND PSYCHIATRY

A meeting of the Minnesota Society of Neurology and Psychiatry was held at Rochester on May 26. The program included the following:

Surgical clinics at St. Mary's Hospital, presented by the neurosurgical staff.

Clinicopathologic conference by Dr. George Sayre.

A symposium on cybernetics, with papers presented by Dr. R. G. Mickford, Dr. J. R. Brown, Dr. J. G. Rushton, Dr. D. D. Daly and Dr. H. P. Rome.

A travelogue on Australia by Dr. L. M. Eaton.

MICHAEL REESE HOSPITAL POSTGRADUATE SCHOOL

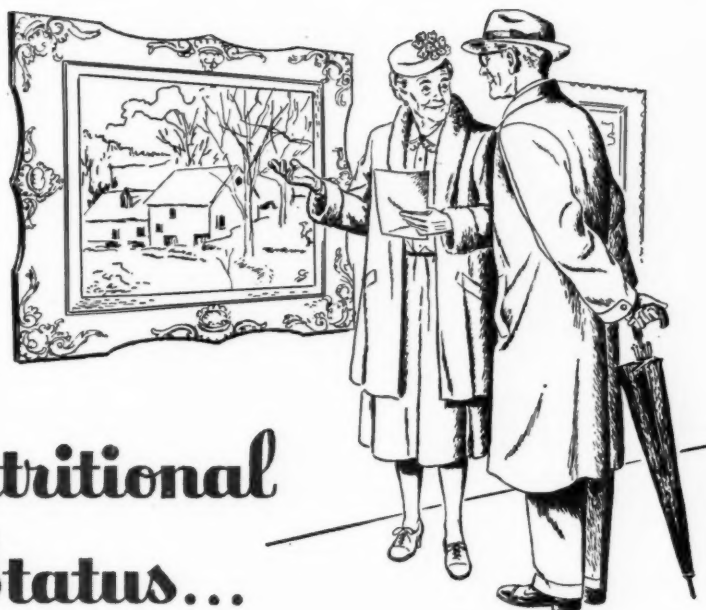
The Michael Reese Hospital Postgraduate School is offering a two-week course in "Diseases of the Endocrines—Physiology and Diagnostic Methods." This full-time intensive course will be held from July 9 to 21 and will consist of a balanced program of basic information and clinical applications. Dr. Rachmiel Levine, director, Department of Metabolic and Endocrine Research, is co-ordinator of the course.

A full-time intensive course in "Hematologic Diagnosis," under the direction of Dr. Karl Singer, will be presented by the Michael Reese Hospital Postgraduate School from July 23 to August 4. This two-week course will offer a review of the present status of hematology and instruction in actual reading of slides of normal and pathological specimens of peripheral blood and bone marrow.

For further information on either course, write Dr. Samuel Soskin, Dean, 29th Street and Ellis Avenue, Chicago 16, Illinois.

Twenty-four per cent of all drivers involved in fatal accidents in the United States last year were between the ages of eighteen and twenty-four.

Ninety-eight per cent of drivers involved in fatal automobile accidents in the United States last year had at least one year's driving experience.



Nutritional Status...

AN IMPORTANT FACTOR IN OLD AGE

A RECENT study¹ of the health and nutritional status of 200 elderly patients and their dietary habits revealed their food intake to be deficient in iron, calcium, protein, and, particularly, B complex vitamins. In many instances the lassitude and premature weakness of the elderly are due to such deficiencies.

Correction by increased intake of ordinarily eaten foods often proves difficult. The quantities that would have to be eaten frequently are more than the individual can consume comfortably.

Ovaltine in milk—a tasty, readily accepted and easily digested food supplement—offers a simple solution to this problem. Its wealth of biologically adequate protein, quickly utilizable carbohydrate, and needed vitamins and minerals, serves well in the aim of bringing nutrient intake to optimal levels.

The nutritional contribution of three servings of Ovaltine in milk (the recommended daily amount) is defined in the appended table.

1. Bortz, E. L.: Management of Elderly Patients, Postgraduate Med. 3:186 (Mar.) 1950.

THE WANDER COMPANY, 360 N. MICHIGAN AVE., CHICAGO 1, ILL.



Ovaltine

Three servings of Ovaltine, each made of
1/2 oz. of Ovaltine and 8 oz. of whole milk,* provide:

PROTEIN	32 Gm.	VITAMIN A3000 I.U.
FAT	32 Gm.	VITAMIN B ₁116 mg.
CARBOHYDRATE	65 Gm.	RIBOFLAVIN	2.0 mg.
CALCIUM	1.12 Gm.	NIACIN	6.8 mg.
PHOSPHORUS94 Gm.	VITAMIN C	30.0 mg.
IRON	12 mg.	VITAMIN D	417 I.U.
COPPER	0.5 mg.	CALORIES	676

*Based on average reported values for milk.

Two kinds, Plain and Chocolate Flavored. Serving for serving, they are virtually identical in nutritional content.

In Memoriam

WILLARD LATHROP BURNAP

Dr. Willard L. Burnap, an outstanding citizen of Fergus Falls, died May 9, 1951, at the age of seventy-seven.

He was born at Dover, New Hampshire, January 28, 1874. He attended the public schools of Clear Lake, Iowa, received his B.S. from the University of Minnesota in 1897 and his M.D. from Rush Medical College in 1901. In later years he continued his medical training at Cook County Hospital, Chicago, Harvard Medical School, Chicago Eye, Ear, Nose and Throat Hospital, and at numerous seminars at the University of Minnesota and elsewhere.

Dr. Burnap was a Fellow of the American College of Surgeons and of the Radiological Society of North America. He was also a member of the Masonic order, the B.P.O.E. and the medical fraternity, Alpha Kappa Kappa.

Dr. Burnap was active not only in his local medical society, the Park Region, but in affairs of the Minnesota State Medical Association. He had been a member of the Council of the State Association since 1922, except for the year 1925 when he served as president. He was chairman of the Council from 1941 to 1946. In

1944 he received the Association's highest honor—the Distinguished Service Award and Medal. He served at times as a delegate from Minnesota to the American Medical Association.

He was instrumental in the creation of the Northern Minnesota Medical Association in 1920, served as its secretary and general manager for four years, retiring to become its president. In his presidential address he spoke simply but eloquently of the purpose of this association. "It has come that we may better know our neighbor physicians, learn their hopes and aspirations, profit by their experiences and comfort them in their misfortunes."

Dr. Burnap was a leader in the organization of the North Central Conference on Medical Service, an organization of officers and leaders in medicine in the six states in this area. This was the organization that preceded and led to the formation of the National Conference on Medical Service. Responsible to a large degree for the initiative of this group, Dr. Burnap led it into channels of constructive thought and action for better medical service, and served as president of the National Conference in 1944.

No sketch of Dr. Burnap's life would be complete

New LEVERAGE FOR CONTROL of Certain Heart and Respiratory Disorders



Dorsaphyllin now affords the therapeutic action of theophylline, buffered by sodium glycinate to reduce gastric irritation. With gastric acidity thus neutralized and precipitation of theophylline in the stomach prevented, the buffered drug is well tolerated in larger doses. In addition, having neither enteric nor sugar coating, Dorsaphyllin tablets disintegrate rapidly in the stomach and absorption begins immediately. By permitting the physician a freer hand in determining dosage, and by removing the obstacle to prompt therapeutic response, Dorsaphyllin brand of theophylline-sodium glycinate is providing new leverage in the management of such disorders as congestive heart failure, Cheyne-Stokes respiration, bronchial asthma, and status asthmaticus.

Tablets • Elixir • Suppositories
For children, palatable Elixir Dorsaphyllin is acceptable and well tolerated. For the hypersensitive, Dorsaphyllin Suppositories are available.

From The Literature

- Bubert and Cook, Bulletin of School of Medicine, Univ. of Maryland, Vol. 32, pp. 175-190, 1948.
- Paul and Montgomery, J. Iowa State Med. Soc., June, 1948.
- Krantz, Holbert, Iwamoto and Carr, J.A.Ph.A., Vol. 36, pp. 248-250, 1947.
- New and Non-official Remedies, 1950, p. 285.



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BRAND OF THEOPHYLLINE-SODIUM GLYCINATE

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SOPRONOL IN DERMATOPHYTOSIS

(Athlete's Foot)



Effectiveness and Safety Proved in Clinical Practice

Two recent reports on SOPRONOL therapy establish its value.

1. "Propionate-caprylate mixtures...proved superior to other local medications used in 10 patients observed during this study ... No instances of irritation or sensitivity were observed."¹

2. "In this series of 39 patients ... the conclusion is reached

that propionate-caprylate treatment is eminently effective ... None of the patients complained of irritation and there was no evidence of sensitization. On the contrary, pre-existing 'id' areas disappeared during treatment."²

1. Nettleship, A.: Arch. Dermat. & Syph. 61:669, 1950
2. Brewer, W. C.: Arch. Dermat. & Syph. 61:681, 1950

Sopronol therapy is a therapy of choice with physician after physician.

SOPRONOL®

PROPIONATE-CAPRYLATE COMPOUNDS Wyeth

OINTMENT

Sodium propionate	12.3%
Propionic acid	2.7%
Sodium caprylate	10.0%
Zinc caprylate	5.0%
Diethyl sodium sulfosuccinate	0.1%
Inert ingredients	69.9%
including n-Propyl Alcohol	10.0%

1 oz. tubes

POWDER

Calcium propionate	15.0%
Zinc propionate	5.0%
Zinc caprylate	5.0%
Inert ingredients	75.0%

2 and 5 oz. canisters

SOLUTION

Sodium propionate	12.3%
Propionic acid	2.7%
Sodium caprylate	10.0%
Diethyl sodium sulfosuccinate	0.1%
Inert ingredients	74.9%
including n-Propyl Alcohol	12.5%

2 oz. bottles

Wyeth Incorporated, Philadelphia 2, Pa.

IN MEMORIAM



200 acres on the shores of beautiful Lake Chisago

The methods of treatment used at the Hazelden Foundation are based on a true understanding of the problem of alcoholism. Among the founders of the nonprofit Hazelden Foundation are men who have recovered from alcoholism through the proved program of Alcoholics Anonymous and who know the problems of the alcoholic. All inquiries will be kept confidential.

HAZELDEN FOUNDATION

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WHERE ALCOHOLICS ACHIEVE INSPIRATION FOR RECOVERY

Where gracious living, a homelike atmosphere and understanding companionship contribute to successful rehabilitation.

without mention of some of the community activities in which he took part for the betterment of his fellow men. A charter member of the Kiwanis, he was past president and district councillor, a member of the board of directors and a member of the local committee for boys' and girls' work. He was a member of the Camp-fire Council, of which he was president for many years. A lover of good music, he was a charter member of the Fergus Falls Concert Association which brought outstanding artists to the city. He was a member of the Federated Church of Fergus Falls.

Dr. Burnap is survived by his wife, the former Mary Merrill whom he married June 25, 1901, and four daughters: Mrs. E. C. Jackson, Minneapolis; Mrs. R. L. Rasche, Beverly, Massachusetts; Mrs. R. C. Bruce, Jr., Montrose, California; and Mrs. T. S. Donoho, Fergus Falls.

The influence of Dr. Burnap's dynamic personality, tempered by his love for his fellow men, will be long and widely felt.

GOTTFRIED WILLIAM CALLERSTROM

Dr. G. W. Callerstrom, Minneapolis, died May 6, 1951. He was sixty-seven years of age.

Dr. Callerstrom was born in Gowrie, Iowa, June 3, 1883. He obtained a B.A. degree from the University of Minnesota in 1903 and his M.D. in 1906. His internship was served at the Swedish Hospital in Minneapolis. He took postgraduate training in Vienna in 1914.

During World War I he served as Captain in the Medical Corps of the Army. From 1923 to 1942, he served as Deputy Coroner of Hennepin County.

A member of the Hennepin County Medical Society, the Minnesota State Medical Association and the American Medical Association, he was also a Mason and a member of Phi Rho Sigma medical fraternity.

Dr. Callerstrom is survived by his wife and three daughters, Miss Goldwyn R. Callerstrom, Mrs. James Grenell and Mrs. Joseph N. Salino.

CHARLES GOLDIE SUTHERLAND

Dr. Charles G. Sutherland, formerly an x-ray specialist at the Mayo Clinic before his retirement in 1942, died May 4, 1951.

Born at Hamilton, Ontario, June 19, 1877, Dr. Sutherland obtained the degree of Bachelor of Medicine from the University of Toronto in 1907 and in 1928 the degree of Doctor of Medicine from the same university. His internship was served at Hamilton General hospital and he took postgraduate work at Johns Hopkins.

He practiced at Cobalt and Porcupine, Ontario, from 1910 to 1912 and at Moose Jaw, Saskatchewan, from 1912 to 1915. He was with the British Expeditionary Forces from 1915 to 1918, serving with the rank of major. Upon his discharge from the army, he joined the Mayo Clinic in 1918, becoming a staff member in 1923.

(Continued on Page 615)



Since the first of June

this new Upjohn plant has
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It is the culmination of
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four years of building.

These greatly expanded
Upjohn facilities keep pace
with rapid advances in
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Medicine...Produced with care...Designed for health

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◆ Of General Interest ◆



In June, 1951, **Dr. A. J. Chesley**, executive officer of the State Board of Health, will have completed fifty years in the Health Department. He started work as a clerk in June, 1901. During the next twenty years, he served the Health Department in various capacities. He obtained his M.D. degree from the University of Minnesota in 1907. In May, 1921, the Board of Health named him executive officer. Thus 1951 is a double anniversary for "the Chief"—his fiftieth year with the Health Department and his thirtieth as state health officer. Dr. Chesley, dean of state health officers, is one of the few people in the nation who has devoted his entire professional life to public health.

* * *

Eighteen Minnesota physicians, each of whom has practiced medicine for fifty years, became members of the Fifty Club of the Minnesota State Medical Association at the annual meeting at Rochester on April 30, May 1 and 2.

The eighteen physicians are **Dr. Bertram S. Adams**, Hibbing; **Dr. Axel C. Baker**, Fergus Falls; **Dr. Rudolph A. Beise**, Brainerd; **Dr. James Blake**, Hopkins; **Dr. Edward A. Eberlen** and **Dr. James R. Elsey**, Glenwood; **Dr. John W. Ekblad**, Duluth; **Dr. Robert C. Farrish**, Sherburn; **Dr. Henry T. McGuigan**, Red Wing; **Dr. James A. Sanford**, Savage; **Dr. Francis J. Savage**, Saint Paul; **Dr. Charles L. Sherman**, Luverne; and **Dr. William H. Aurand**, **Dr. Aeneas MacDonald**, **Dr. Charles N. Spratt**, **Dr. Samuel E. Sweitzer**, **Dr. Hugh J. Tunstead** and **Dr. S. Marx White**, all of Minneapolis.

* * *

There are today some 500 more registered nurses in hospitals and related institutions in Minnesota than there were two years ago according to the hospital licensing unit of the Minnesota Department of Health. There is still, however, much greater demand for both registered and practical nurses than there is supply.

* * *

Dr. Martin E. Janssen of the Northwestern Clinic in Crookston was guest speaker at a meeting of the local Rotary Club on April 19. His talk on the "Treatment and Rehabilitation of Paralytics" was illustrated with motion pictures.

* * *

Among physicians attending a three-day continuation course in gynecology at the University of Minnesota on April 9 to 11 were **Dr. E. E. Christensen**, Winona; **Dr. Donald E. Nealy**, Adrian; **Dr. Edwin A. Kilbride** and **Dr. Frederick L. Schade**, both of Worthington.

Dr. Clarence Dennis of Saint Paul, professor of surgery at the University of Minnesota, has resigned to become a full professor and director of the division of general surgery at the new State University of New York. **Dr. Karl E. Karlson**, a U. S. Public Health fellow in surgery who has been working with Dr. Dennis on the mechanical heart project, will accompany him to New York.

Dr. Dennis is a graduate of Central High School, Saint Paul, and he received his M.D. degree from Johns Hopkins University in 1935. He served an internship at the University of Minnesota and received his surgery doctorate in 1940. He is the son of the late Dr. Warren A. Dennis, at one time a leading surgeon of Saint Paul.

* * *

Dr. Clyde A. Undine, Minneapolis, attended the thirty-second annual session of the American College of Physicians in St. Louis, Missouri, April 9 to 13.

* * *

Dr. W. G. Tomhave of the Mesaba Clinic in Chisholm has been appointed village health officer by the Kinney village council.

* * *

Dr. Harvey Nelson, Minneapolis, has been appointed chief surgeon of the Soo Line railroad to succeed **Dr. Frank R. Hirschfield**. A graduate of the University of Minnesota Medical School, Dr. Nelson has practiced in Minneapolis since 1925.

* * *

Dr. Robert S. Berghoff, clinical professor of medicine at Loyola University and Stritch School of Medicine, spoke at the annual banquet of the Clinical Club of Saint Paul on April 14. His subject was "The Management and Outlook of Coronary Disease," and he proved to be an instructive and entertaining speaker. His concept that each attack of angina pectoris represents a thrombotic attack is not in agreement with that of the late Dr. Herrick, a fellow Chicagoan who first described coronary thrombosis.

* * *

Dr. Robert M. Sandeen, formerly of Saint Paul, has moved to Buffalo and has become associated in practice with **Dr. T. J. Catlin** and **Dr. J. J. Catlin**. A graduate of the University of Minnesota Medical School, Dr. Sandeen interned at Bethesda Hospital, Saint Paul, in 1945. He then served in the Army for two years, following which he practiced in Saint Paul.

* * *

Dr. Cecil J. Watson, professor of medicine and head of the department of internal medicine at the Uni-

(Continued on Page 600)



BELIEVE IN YOURSELF!

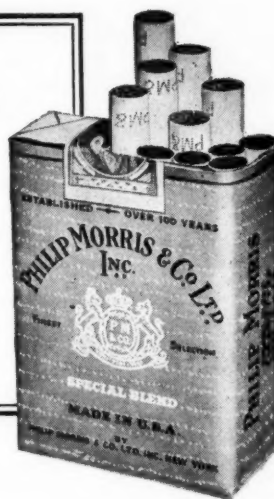
Doctor, you probably have read a great deal of cigarette advertising with all sorts of claims.

So we suggest: make this simple test...

Take a PHILIP MORRIS — and *any* other cigarette. Then,

1. Light up either one. Take a puff — don't inhale — and s-l-o-w-l-y let the smoke come through your nose.

2. Now do exactly the same thing with the other cigarette.



Then, Doctor, BELIEVE IN YOURSELF!

PHILIP MORRIS

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OF GENERAL INTEREST

(Continued from Page 598)

versity of Minnesota, was re-elected recorder of the Association of American Physicians at its meeting in Atlantic City on May 2.

* * *

Dr. L. M. Hammar of the Mankato Clinic was the principal speaker at a session of the forty-third semi-annual clinical course of the Lyon-Lincoln Counties Medical Society in Marshall on April 17. The title of his lecture was "Medical Aspects of Atomic Energy."

* * *

The annual George E. Fahr Lecture was delivered at the University of Minnesota on May 8 by **Dr. George E. Burch**, professor and head of the department of medicine at Tulane University, New Orleans, Louisiana. Dr. Burch's topic was "Certain Mechanical Peculiarities of the Heart." The lecture was given in connection with a course in electrocardiography at the University of Minnesota Continuation Study Center.

* * *

The Saint Paul Area Public Health Council elected **Dr. D. R. Gillespie** to a third one-year term as council chairman at its meeting on April 26. Named to the executive committee was **Dr. Ralph L. Olsen**, while **Dr. R. B. J. Schoch** was re-elected to the same committee. The council authorized a committee to study reports and information on fluoridation of municipal water supplies to reduce dental caries.

Dr. H. Bradley Troost, Mankato, was among Minnesota physicians who attended the annual session of the American College of Physicians in St. Louis, Missouri, early in April.

* * *

On April 20, **Dr. John F. Briggs**, Saint Paul, was one of the guest participants in a panel discussion on "The Heart in Relation to Pulmonary Disease" at a joint meeting of the Illinois Chapter of the American College of Chest Physicians and the Chicago Tuberculosis Society.

* * *

Dr. Kenneth L. Nelson, formerly of Balaton, moved to Warroad during the middle of April to open offices for the practice of medicine.

* * *

The U. S. Public Health Service suggested on April 23 that thirty public health units be set up in Minnesota to cover all eighty-seven counties in an effort to co-ordinate hospitals and health departments in the various areas. Oscar R. Ewing, Federal Security Administrator, said that under such a program the local health department, through its link with community hospitals, would be in a better position to establish programs in the control of cancer, diabetes, heart disease, et cetera.

The Public Health Service report suggested how counties could be grouped into units and recommended the minimum number of public health physicians and nurses for each unit. Sample groupings and

(Continued on Page 602)

Dilaudid hydrochloride

(dihydromorphinone hydrochloride)

COUNCIL ACCEPTED



Powerful opiate analgesic - dose, 1/32 grain to 1/20 grain.

Potent cough sedative - dose, 1/128 grain to 1/64 grain.

Readily soluble, quick acting.

Side effects, such as nausea and constipation, seem less likely to occur.

An opiate, has addictive properties.

Dependable for relief of pain and cough, not administered for hypnosis.

● Dilaudid is subject to Federal narcotic regulations. Dilaudid, Trade Mark Bilhuber.

Bilhuber-Knoll Corp. Orange, N. J.

A Preferred Nasal Decongestant and Vasoconstrictor

Otorhinolaryngologists frequently express preference for Neo-Synephrine hydrochloride to alleviate turgescence and nasal congestion in colds, sinusitis and various forms of rhinitis.

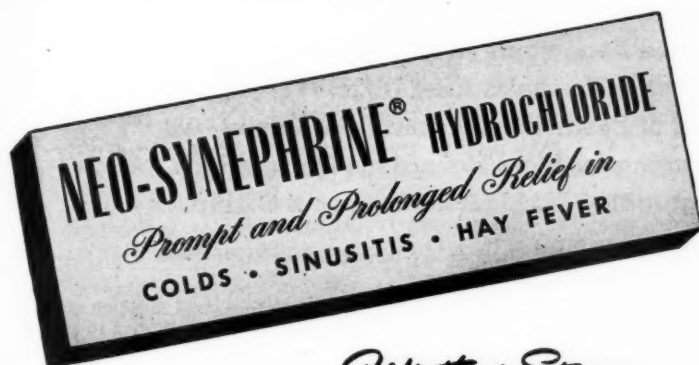
"When considerable nasal obstruction exists, relief may be obtained by the instillation of some shrinking agent into the nose... as for example Neo-Synephrine hydrochloride ($\frac{1}{4}\%$)"¹

A "desirable preparation of this type has been perfected in Neo-Synephrine hydrochloride. It may be used for local application in the nose in $\frac{1}{4}$ to 1% solution."²

Neo-Synephrine's "desired effect occurs within from two to fifteen minutes..."³

"Its action is sustained for two hours or more."³

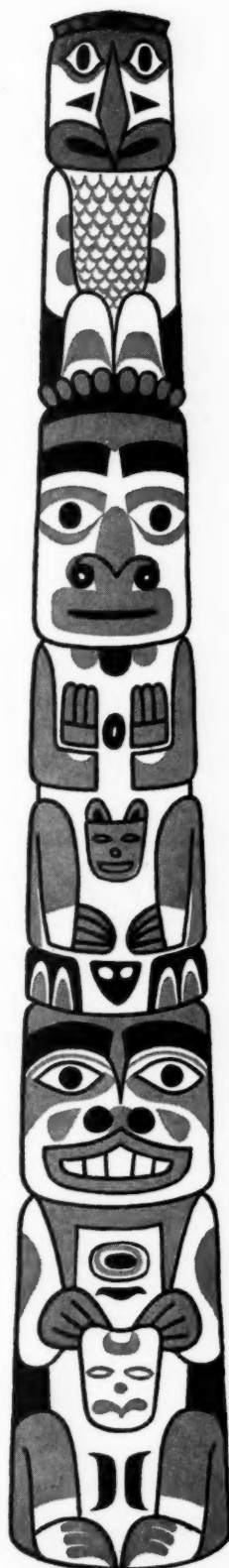
Neo-Synephrine hydrochloride is notable for freedom from sting and for effectiveness on repeated application. There are few complaints of after effects such as burning and nasal congestion... and little tendency to develop local sensitivity.¹



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1. Tuft, L.: *Clinical Allergy*. Philadelphia, W. B. Saunders Co., 1947, pp. 335-336.
2. Hansel, F. K.: *Allergy of the Nose and Paranasal Sinuses*. St. Louis, C. V. Mosby Co., 1936, p. 769.
3. Kelley, S. F.: *Choice of Sympathomimetic Amines*, Cornell Conferences on Therapy, II, 1947, p. 156.

Neo-Synephrine, trademark reg. U. S. & Canada, brand of phenylephrine



OF GENERAL INTEREST

(Continued from Page 600)

recommended personnel are as follows: Norman, Polk and Red Lake Counties—one physician and twelve nurses. Benton and Stearns Counties—two physicians and seventeen nurses. Cook, Lake and St. Louis Counties—four physicians and forty-three nurses. Chisago, Ramsey and Washington Counties—seven physicians and seventy nurses.

Mr. Ewing stated that the report was only a guide and not a blueprint of what should be done.

* * *

It was announced on April 24 that **Dr. M. J. Shapiro** would leave the University of Minnesota on July 1 to enter private practice in Los Angeles, California. Director of the out-patient clinic at the new Variety Club Heart Hospital at the University, Dr. Shapiro has been a leader in the fight against rheumatic heart disease for more than a quarter century. Through his efforts during the years, special classes and schools have been made available to children with heart disease who could not attend regular schools.

* * *

Dr. C. L. Sherman, Luverne, was reappointed to the Minnesota State Board of Medical Examiners by Governor Luther W. Youngdahl on May 3.

* * *

Dr. Gaylord W. Anderson, director of the University of Minnesota School of Public Health, has

been elected president of the Association of Schools of Public Health.

* * *

Dr. James W. Crump, who guided the destinies of the Hallie Q. Brown House, a Community Chest agency in Saint Paul, for twenty of its twenty-two years, was honored at special anniversary ceremonies on April 29. Dr. Crump, who recently retired as president of the organization, was presented with a plaque in recognition of his years of service.

A graduate of the University of Iowa in 1914, Dr. Crump became the first American Negro to be admitted to the American Medical Association. He practiced in Denver and in Pittsburg, Texas, before moving to Saint Paul. Two years after the Hallie Q. Brown House was founded, Dr. Crump was elected as its president. Under his direction it has grown to be an important center in the Negro community in Saint Paul. Its services include well-baby clinics, conducted twice a week, and social and recreational programs for both children and adults.

* * *

Dr. J. Arnold Malmstrom, Virginia, attended a one-week course in proctology at the University of Minnesota Center for Continuation Study during the middle of April.

* * *

The American Cancer Society motion picture, "Breast Self-Examination," and another film en-

(Continued on Page 604)

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Clinical experience^{1,2} and investigative data³ indicate that the liberal use of meat may not be contraindicated when sodium intake must be restricted. Because unsalted meat contains only relatively small amounts of sodium, while contributing importantly to other nutrient needs, meat deserves special consideration in very-low-sodium diets, in sodium-poor diets, and in no-extra-sodium diets.

Table I lists the amounts of sodium³ in three kinds of meat. Table II gives the estimated amounts of sodium in hospital diets planned for cardiorenal vascular patients.⁴

SODIUM IN MEAT³

	Sodium Provided by 60 Gm. Serving	Sodium Provided by 100 Gm.
Beef, without bone	32 mg.	53 mg.
Lamb, without fat	66 mg.	110 mg.
Pork, without fat	35 mg.	58 mg.

Table I

SODIUM IN HOSPITAL DIETS⁴

Sodium-Poor Diets*				Very-Low-Sodium Diet†
40 Gm. Protein	70 Gm. Protein	100 Gm. Protein	130 Gm. Protein	70 Gm. Protein
400 mg. Na	500 mg. Na	800 mg. Na	1,000 mg. Na	200 mg. Na

Table II

*Foods prepared and served without salt.

†Weighed diet. May contain 4 oz. of unsalted meat.

(Normal diets contain approximately 4 Gm. of sodium daily.)

Hence, the data here shown indicate that relatively generous amounts of meat may be included in low-sodium diets.

Meat serves well in the therapeutic objective of maintaining a high state of nutrition in patients with congestive heart failure or nephritic edema by providing valuable amounts of biologically complete protein and of B complex vitamins, including the recently discovered B₁₂.

1. Wheeler, E. O.; Bridges, W. C., and White, P. D.: Diet Low in Salt (Sodium) in Congestive Heart Failure, J.A.M.A. 133:16 (Jan. 4) 1947.

2. Wohl, M. G., and Schneeberg, N. G.: Dietotherapy (Cardiovascular Disease), in Jolliffe, N.; Tisdall, F. F., and Cannon, P. R.: Clinical Nutrition, New York, Paul B. Hoeber, Inc., 1950, chap. 27.

3. Bills, C. E.; McDonald, T. C.; Niedermeier, W., and Schwartz, M. C.: Survey of the Sodium and Potassium Content of Foods and Waters by the Flame Photometer, Fed. Proc. 6:402 (Mar.) 1947.

4. Mayo Clinic Diet Manual, Philadelphia, W. B. Saunders Company, 1949, p. 113.

The Seal of Acceptance denotes that the nutritional statements made in this advertisement are acceptable to the Council on Foods and Nutrition of the American Medical Association.



American Meat Institute
Main Office, Chicago... Members Throughout the United States

OF GENERAL INTEREST

(Continued from Page 602)

titled "The Doctor Speaks His Mind" were presented by **Dr. Carleton A. Nelson** of the Worthington Clinic at a meeting in Worthington on April 16. Sponsor of the meeting, which was open to women only, was the auxiliary to the Clavin-Knuth Post of the American Legion.

* * *

Dr. C. Walton Lillehei, instructor and researcher at the University of Minnesota, was awarded the Theobald Smith medal for distinguished work in his field at a meeting in Cleveland, Ohio, on May 2. The medal, which is given by the American Association for the Advancement of Science and which carries a \$1,000 cash award, was presented to Dr. Lillehei for his studies on the importance of stress in producing ulcers and of the effects of stress on the heart.

* * *

Dr. Charles W. Rogers, Winona, has been certified by the American Board of Pediatrics. Certification followed a series of examinations taken by Dr. Rogers in Cincinnati, Ohio, late in March. Dr. Rogers is a graduate of the University of Minnesota Medical School and is a partner and chief pediatrician at the Winona Clinic.

* * *

It was announced on May 3 that eight or ten stories would have to be eliminated from the Mayo

Memorial Medical Center, under construction at the University of Minnesota, because the legislature failed to appropriate additional funds needed due to inflated costs.

When ground was broken for the new building last summer, plans called for a twenty-two-story structure and funds on hand totaled more than \$12,200,000. In March the University told the legislature that, because of increased costs, another \$2,250,000 would be needed. After failure to get the additional appropriation, University officials announced that all bids on the structure had been rejected and that plans would have to be redrawn completely.

* * *

Dr. Robert B. May, clinical director and assistant superintendent at the Fergus Falls State Hospital, has resigned his position there, it was announced on April 14, and has accepted a position on the staff of the Veterans Hospital at Knoxville, Iowa. Dr. May was assistant superintendent of the Willmar State Hospital before moving to Fergus Falls.

* * *

Dr. Arthur Kirschbaum, associate professor of anatomy at the University of Minnesota, was presented with a medal from the Minnesota Division of the American Cancer Society on April 21. The annual award was given to Dr. Kirschbaum for his "outstanding work" in leukemia research.

(Continued on Page 606)

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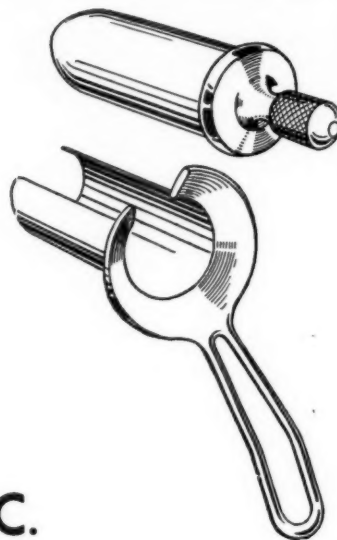
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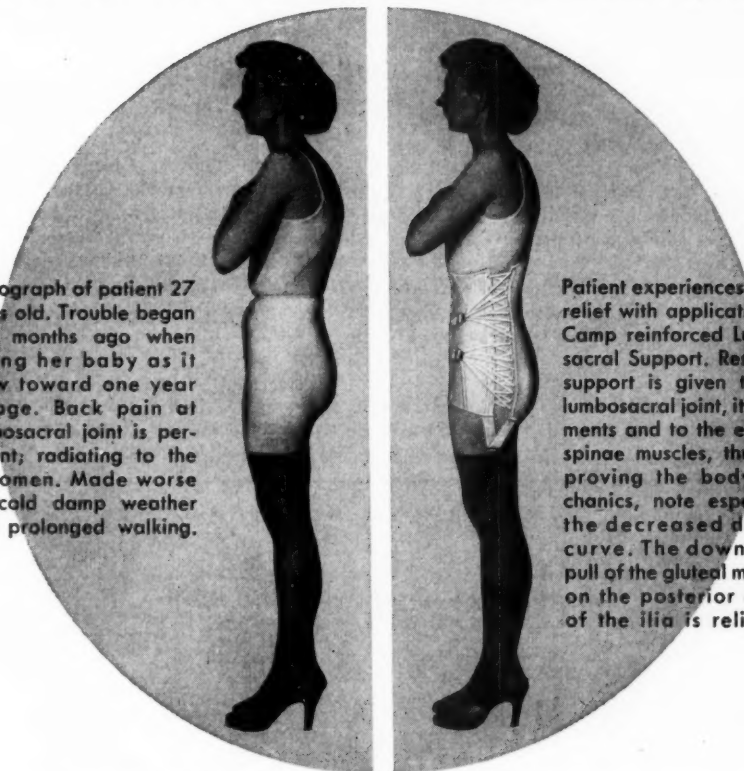
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OF GENERAL INTEREST

(Continued from Page 604)

The first of a series of PTA-sponsored preschool clinics in the Iron Range was held at Buhl on April 13. At the clinic, sixty-six preschool children were given physical examinations, Mantoux tests and diphtheria inoculations. The clinic was directed by **Dr. W. G. Tomhave** of Chisholm.

* * *

The work done by medical technicians was demonstrated at an open house held in the laboratory of Miller Hospital, Saint Paul, on April 22. Participating in the demonstration were fifteen Macalester College medical technologists completing their training at the hospital. The hospital training program is under the direction of **Dr. Kano Ikeda**.

* * *

Tribute was paid to **Dr. and Mrs. I. George Wiltrout** by residents of the Oslo community at an open house in the Oslo American Legion Hall in April. The program honoring the physician for his years of service consisted of brief talks by some of his friends, musical selections, and presentation of a purse of money.

Dr. Wiltrout has practiced in Oslo since 1920. In addition to the duties of his practice, he has served as village mayor, as a member of the board of education, and as health officer.

* * *

Dr. L. C. Kolb, Rochester, was a speaker at a superintendents' meeting of the Minnesota State

Mental Health Program in Minneapolis on April 20. The title of his talk was "Morphologic and Physiologic Changes Following Lobotomy."

* * *

Dr. Gordon R. Kamman, Saint Paul, spoke on "Neuropsychiatric Disorders in General Practice" at a meeting of the Park Region Medical Society in Fergus Falls on April 25. **Dr. Kamman** was also a speaker at a meeting of the Seventh District Medical Society at Sioux Falls, South Dakota, on May 1. The title of his talk there was "Psychotherapy and Psychosomatics."

* * *

Dr. Sherwood B. Seitz has moved back to Barnesville from Mott, North Dakota, and has reopened offices for the practice of medicine.

* * *

Dr. Philip Thorek, Chicago, was the principal speaker at a meeting of the Hennepin County Medical Society in Minneapolis on May 7. **Dr. Thorek**, who is clinical assistant professor of surgery at the University of Illinois and associate professor of surgery at the Cook County Graduate School of Medicine, discussed acute conditions of the abdomen in his talk.

* * *

An inscribed wristwatch was presented to **Dr. E. A. Pasek** by his friends in Carlton before he left on May 5 for Randolph Field, Texas, to enter the

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Air Force. Presentation of the watch was made by the president of the Carlton Chamber of Commerce.

* * *

At a meeting of the Memphis and Shelby County Heart Association in Memphis, Tennessee, on April 25, Dr. W. F. Kvale of Rochester presented a paper entitled "The Diagnosis and Treatment of Occlusive Arterial Disease of the Extremities."

* * *

The Clearwater County Clinic in Bagley held a formal open house for the public on May 5. The new twelve-room clinic is in a building which was formerly the old Clearwater Hospital but which has been completely remodeled and redecorated. The

staff of the clinic now includes Dr. L. J. Larson and Dr. Bernard S. Nauth.

* * *

It was announced on May 3 that Dr. Cherry B. Cedarleaf had ended her association in practice with Dr. L. H. Rutledge and Dr. C. W. Moberg at Detroit Lakes and that she planned to open her own practice at Mahtomedi, near White Bear Lake.

* * *

Dr. C. H. Scheifly, Rochester, spoke on "Difficulties in the Diagnosis of Coronary Artery Disease" at a meeting of the Marshall County Medical Society at Marshalltown, Iowa, on May 1.



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Among Minnesota physicians who attended a course on the treatment of victims of atomic bombs at the University of Minnesota Continuation Center on May 26 and 27, was **Dr. John C. Vezina** of Mapleton.

* * *

Dr. S. Friefeld of Brookings, South Dakota, has become associated on a part-time basis with the staff of the Weiner Memorial Hospital at Marshall. Dr. Friefeld, a radiologist who serves on the staffs of several southwest Minnesota hospitals, is available at the Weiner Hospital on Thursday of each week.

* * *

Dr. John B. Erich, Rochester, participated in a course on cancer at the University of Nebraska at Lincoln, Nebraska, on May 8. The subject of his presentation was "Cancer of the Mouth."

* * *

In April, **Oklahoma** became the fourth state to adopt a law providing for use in medical research dogs ordinarily killed in public pounds. The law licenses research laboratories eligible to receive animals for experimental use and provides for inspection of laboratories by the State Department of Public Health. Such provision stretches dollars contributed to heart, cancer and other research funds.

* * *

Major General David Grant, wartime Surgeon General of the Air Force, on May 1 became director of the American Red Cross National Blood Program, a new position. He also became medical director of the American Red Cross, replacing Dr. G. Foard McGinnes, who has resigned effective July 15. Dr. Grant will direct all phases of the Red Cross blood program. The program now provides blood for military requirements, for civilian needs and for plasma stockpiling for civil defense.

HOSPITAL NEWS

Dr. C. C. Craig was re-elected chief-of-staff of the **Falls Memorial Hospital**, International Falls, at the annual staff meeting on April 9. **Dr. F. G. Chermak** was named vice president of staff, a new office, and **Dr. D. M. Potek** was elected secretary-treasurer.

* * *

A psychiatric hospital has been opened by **Immanuel Hospital** at Mankato. Although it is an integral part of the main hospital, the unit is housed in a separate building on the grounds. Facilities for all types of psychiatric and neurological treatment are available.

Mrs. Karla Miller, a graduate of Mounds Park Hospital, is in charge of the nursing staff at the psychiatric unit. **Dr. William Chalgren** is staff advisor.

* * *

Dr. John A. Thabes, Sr., oldest staff member of **St. Joseph's Hospital** in Brainerd, turned over the first shovel of earth in ground-breaking ceremonies on April 24 for a new two-million-dollar hospital building. The new structure, which will house 117



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beds and 28 cribs, is being constructed just south of the old St. Joseph's Hospital building. Completion of construction is expected within two years. Cost of the hospital will be paid by the Benedictine Sisters, with the aid of a government grant.

* * *

About 2,000 people inspected the facilities of the new **Triumph-Monterey Community Hospital** at an open house held on April 15. Visitors were conducted through the new building in small groups and heard detailed descriptions of the equipment and functions of the hospital. Ice cream, coffee and cookies were served by members of the hospital auxiliary. It was announced that the hospital would probably be opened to patients on April 23.

* * *

At a meeting of the staff of the **Community Hospital** in Princeton on April 16, Dr. William T. McManus, Princeton, was elected president. Named as vice president was Dr. D. J. Sanderson, Princeton, and as secretary, Dr. Norman Metcalf, Onamia. The hospital now has seventeen physicians, from five cities, on its staff.

* * *

It was announced on April 24 that thirty-five staff members of **Northwestern Hospital**, Minneapolis, were serving as a "pilot" class in studying a complete program of standard, advanced and instructor first aid, including special techniques for atomic bomb injuries. The class included physicians, nurses, and

administrative and maintenance personnel. It was planned that the thirty-five trainees would later teach the remaining hospital employees the newest first aid techniques. The training plan was part of Northwestern Hospital's program for civil defense in case of bombing attack.

* * *

The **Blue Earth Community Hospital** board reported to the city council on April 17 that although the hospital had been faced with a \$3,000 deficit in January, it was well into the "black" for the first quarter of 1951. The change in financial condition, it was pointed out, was due to very heavy patient traffic during the three-month period. The hospital board stated that because of the increased patient traffic it was probable that additional personnel would be required. The board reported that it was well aware that the hospital was a nonprofit institution and that it would be kept that way.

* * *

Dedication of the new treatment and reception center at the **Hastings State Hospital** was held on April 27, attended by about 300 patients, staff members and guests. Included in the dedication ceremonies were brief talks by Dr. Ralph Rossen, state mental health commissioner, and Governor Luther W. Youngdahl.

The new two-story brick building was completed in March at a cost of almost a million dollars. One of the most completely equipped centers of its kind,

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SURGERY—Intensive Course in Surgical Technique, two weeks, starting July 9, July 23, August 6, August 20.
Surgical Technique, Surgical Anatomy and Clinical Surgery, four weeks, starting July 9, August 6, September 10.
Surgical Anatomy and Clinical Surgery, two weeks, starting July 23, August 20, September 24.
Surgery of Colon and Rectum, one week, starting September 17, October 15.
Esophageal Surgery, one week, starting October 15.
Thoracic Surgery, one week, starting October 8.
Gall-bladder Surgery ten hours, starting October 22.
Breast and Thyroid Surgery, one week, starting October 1.
Fractures and Traumatic Surgery, two weeks, starting October 8.

GYNECOLOGY—Intensive Course, two weeks, starting September 24, October 22.
Vaginal Approach to Pelvic Surgery, one week, starting September 17, November 5.

OBSTETRICS—Intensive Course, two weeks, starting September 10, November 5.

MEDICINE—Intensive General Course, two weeks, starting October 1.
Gastroenterology, two weeks, starting October 15.
Gastroscopy, two weeks, starting July 16.
Electrocardiography and Heart Disease, two weeks, starting July 16.
Liver and Biliary Diseases, one week, starting September 17.

PEDIATRICS—Cerebral Palsy, two weeks, starting July 9.
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BLUE CROSS-BLUE SHIELD NEWS

The annual meeting of National Blue Cross-Blue Shield plans was held at Biloxi, Mississippi, April 15 through 18, last. Several officers and executive personnel of Minnesota Blue Cross and Blue Shield were in attendance and participated in the program. Progress of voluntary hospital and medical care was reviewed and much valuable information pertaining to administration of the constantly expanding voluntary prepaid plans was obtained.

At the recent joint meeting of the Council of the Minnesota State Medical Association and the Directors of Blue Shield, in Rochester, April 30, increasing the number of Blue Shield participating physicians received major emphasis. In an attempt to secure as nearly as possible 100 per cent participation in Minnesota Blue Shield of the practicing Minnesota physicians, it was voted that each Councilor would be furnished a list of the nonparticipating doctors in his councilor district, and he in turn would personally contact the non-participating doctor inviting his enrollment. These lists will be distributed within the very near future and it is hoped will result in the enrollment with Blue Shield of the remaining doctors in private practice in Minnesota who up to the present time have not seen fit to enroll.

All officers were re-elected, including: Dr. O. I. Sohlberg of Saint Paul as President; Dr. R. R. Cranmer of Minneapolis as Vice President; Dr. C. A. McKinlay of Minneapolis as Secretary, and Dr. W. A. Coventry of Duluth as Treasurer. Also re-elected were the four directors whose terms expired in 1951: Dr. J. F. Norman of Crookston; Dr. E. J. Simons of Minneapolis; Dr. L. L. Sogge of Windom, and Dr. W. W. Yaeger of Marshall.

Blue Shield paid a total of 19,224 claims during the first three months of 1951 as compared with 10,289 claims during the same period of 1950. Payments to date this year total \$689,703.07 as compared with \$411,133.84 for the same period of 1950. With the volume of business transacted it becomes increasingly important that careful attention be given to all details in the payment of medical claims. All claims presented should be complete as to the patient's name and birthdate, the subscriber's name and address, the type of service rendered, the place of service, and, if hospitalized, the name of the hospital and the admission and discharge date, the doctor's signature and his address. If the reports when initially submitted contain all the above listed information, disposition of the claim can be expedited.

The Blue Shield contract allows for payment to only one doctor who may be in attendance on any one case unless the second doctor is treating the patient for a serious medical complication. The surgical allowance provided by Blue Shield is meant to include the actual surgery as well as the pre- and postoperative care during hospitalization, and only in cases of serious medical complications can a medical allowance be provided.

MINNESOTA MEDICINE



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Many claims are presented from both the surgeon and the attending physician, and since only one of them can be paid by Blue Shield in most cases, correspondence is often necessary with the resultant delay in processing. It is suggested that the surgeon and the attending physician decide between themselves which of them is to present the claim for Blue Shield benefits thereby eliminating the need for the Blue Shield office to make that determination.

On April 21, 1951, the third non-group campaign for Blue Cross and Blue Shield closed after a total of 13,850 inquiries or requests for enrollment had been received. Of this number, 3,017 inquiries were directed to Cedric Adams in response to his spot radio announcements. Applications from 4,688 persons were sent to the Blue Cross-Blue Shield office by mail and 3,965 inquiries were received by telephone. In addition, 2,180 requests had been received prior to the announced opening date of the campaign. Applications for non-group contracts are carefully screened with reference to the applicant's medical history, and, if necessary, riders are attached to the contract. Such screening is required due to the higher incidence of illness among the people who apply for a non-group contract.

Reports for the first quarter of 1951 show that Minnesota Blue Shield enrollment as of March 31, 1951, included 433,128 participant subscribers and the non-group enrollment described means a material increase in the near future.

During the first three months of this year 41,020 Blue Cross claims were incurred requiring 234,086 days of hospital care compared with 38,934 claims and 223,137 days of hospital care during the same period of the previous year. Total payment for hospitalization expense for the first three months of this year was \$2,821,097 compared with \$2,464,501 for the same period a year ago. Out of every 1,000 contracts covered during the first three months of this year, 434 used hospital care compared with 426 during the same period of last year. The average hospital expense per day for the first three months of this year was as follows: January, \$11.71; February, \$11.81; March, \$12.60.

MINNESOTA ACADEMY OF MEDICINE

(Continued from Page 590)

The patients were given Lugol's solution for two or three weeks and then operated upon. Nowadays the preparation seems a bit more complicated with the newer drugs. There are advantages in using the antithyroid drugs for the preoperative treatment of these cases, but there are also certain disadvantages, besides the toxic reactions, which have been presented this evening.

I wish to thank all the doctors who took part in the discussion.

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BOOK REVIEWS

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical Libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

HANDBOOK OF MEDICAL MANAGEMENT. Second Edition. Milton Chatton, A.B., M.D., Instructor in Medicine, University of California Medical School, San Francisco; Sheldon Margen, A.B., M.D., Clinical Instructor in Medicine, University of California Medical School; and Henry D. Brainerd, A.B., M.D., Assistant Clinical Professor of Medicine and Pediatrics, University of California Medical School, San Francisco, Assistant Clinical Professor of Pediatrics, Stanford University School of Medicine, Physician in Charge, Isolation Division, San Francisco Hospital. 507 pages. Price \$3.00, flexible binding. Palo Alto: University Medical Publishers, 1951.

TUBERCULOSIS AMONG CHILDREN AND ADULTS. Third Edition. J. Arthur Myers, M.D., Ph.D., Physician in Charge, Chest Clinic, Students' Health Service, University of Minnesota, Chief of Tuberculosis Service, Minneapolis General Hospital, Professor of Medicine, Preventive Medicine and Public Health, Medical and Graduate Schools, University of Minnesota, Minneapolis. With introduction by Allen H. Krause, M.D., Late Lecturer in Medicine, Johns Hopkins University, Past Editor, American Review of Tuberculosis, Baltimore, Maryland. 894 pages. Illus. Price \$12.50, cloth. Springfield, Illinois: Charles C Thomas, 1951.

MEDICINE OF THE YEAR. School of Medicine, Vanderbilt University. 2nd issue. Edited by John B. Youmans, M.D., Dean, Philadelphia: J. B. Lippincott Co. 1950. 204 pages. Price \$5.00.

This book is set up in five sections devoted to Internal Medicine, Psychiatry, Obstetrics and Gynecology, Pediatrics, and General Surgery. Each section is headed by a telegraphic, new-letter type summary of significant advances and developments of the year. These are covered in more detail in paragraphs that follow.

The size of this book does not allow coverage of all topics deemed important by individual readers; however, a very competent staff has edited the individual sections; in general, concise and interesting summaries of each subject are the rule. The book would appear to be helpful to anyone wishing a quick review of recent advances and the bibliography at the end of each section is especially valuable.

This is the second volume of *Medicine of the Year*; one is published yearly beginning in 1949.

R. D. MOONEY, M.D.

PAUL EHRLICH. Martha Marquardt. With an introduction by Sir Henry Dale. 255 pages. Price \$3.50. New York: Henry Schuman, 1951.

This is a pleasant readable book about Ehrlich as he was known to his secretary, Martha Marquardt. Her association with him in his daily work lends an opportunity for her to reveal many interesting anecdotes concerning Ehrlich. This book is in essence an extension

MINNESOTA MEDICINE

BOOK REVIEWS



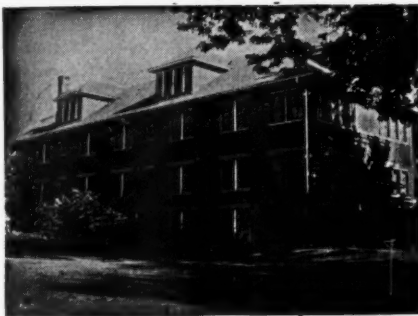
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of her original volume, "Paul Ehrlich als Mensch und Arbeiter," and as such is more in the nature of a biography.

The author gives an interesting account of Ehrlich, not only as a scientist and humanitarian but also as a most interesting and lovable personality. The story of his struggles and finally the development of Salvarsan are the outstanding features of the volume.

The book can be highly recommended to both the professional and lay person because of the fascinating story it tells.

THE ESOPHAGUS AND PHARYNX IN ACTION
(A Study of Structure in Relation to Function). William Lerche, M.D., formerly Associate Professor of Surgery, University of Minnesota. Springfield, Ill., Charles C Thomas, 1950. 222 pages, 93 figures. \$5.50. William Lerche, formerly an associate professor of

surgery at the University of Minnesota, was stimulated to make the study necessary to write this monograph by the uncertainties about the closing mechanism at the gastro-esophageal junction. He approached the study of pharyngeal and esophageal function (as the subtitle of the monograph implies) anatomically, by meticulous dissection and examination of a hundred specimens of human esophagi from the Department of Anatomy at the University of Illinois. Correlation of the anatomic findings, particularly as they are reflected in the act of regurgitation, with previous physiologic, roentgenologic and clinical research on man and animals by others,

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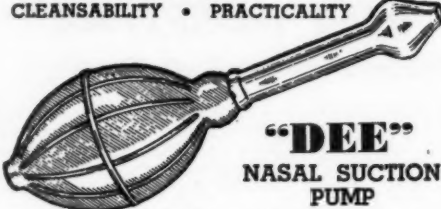
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plus scattered illustrative clinical cases, yields a logical concept of normal function of the pharynx, esophagus and cardia. The presence of a pharyngo-esophageal and a gastro-esophageal vestibule are demonstrated repeatedly, as is the present of an inferior esophageal sphincter and a constrictor cardiae.

The necessarily detailed anatomic discussions make for difficult reading in parts. The illustrations are excellent. The modest number of roentgenograms reproduced as shaded diagrammatic sketches lose nothing in such reproduction and serve well to orient the anatomic detail with clinical examination of the esophagus.

Other studies of pharyngo-esophageal function have been made with emphasis on endoscopic, roentgenologic or physiologic methods, but this monograph stands alone in medical literature in its demonstration, correlation and translation of anatomic detail into terms of function. It should be read by radiologists, endoscopists, gastroenterologists and thoracic and general surgeons.

HENRY G. MOEHRING, M.D.

THE USE OF PEDICLE FLAPS OF SKIN IN PLASTIC SURGERY OF THE HEAD AND NECK. By Gordon B. New, M.D., F.A.C.S., Professor of Plastic Surgery, and John B. Erich, M.D., F.A.C.S., Associate Professor of Plastic Surgery. Both of Graduate School, University of Minnesota, Minneapolis, and Section on Laryngology, Oral and Plastic Surgery, Mayo Clinic, Rochester, Minnesota. 104 Pages. Illus. American Lecture Series Publication Number 56. Price \$3.00. Springfield, Ill.: Charles C. Thomas, 1950.

Pedicle skin flaps have many advantages over ordinary skin grafts, since they carry their own blood supply with a substantial layer of subcutaneous tissue. They are particularly useful about the head and neck for covering severely scarred areas, chronic ulcerations, exposed bone, perforations in the cheek and the reconstruction of lost organs, such as the nose, eyelid, et cetera.

This monograph by Doctors New and Erich, based on their wide experience at the Mayo Clinic, deals with the construction and migration of skin flaps about the head and neck.

Although the work is limited to plastic surgery about the head and neck, the basic principles set down will be of value to anyone doing reconstructive surgery.

EDWARD W. SICKELS, M.D.

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IN MEMORIAM

Charles Goldie Sutherland

(Continued from Page 596)

Besides being a member of the Olmsted-Houston-Fillmore-Dodge County Medical Society, the Minnesota State Medical Association and the American Medical Association, Dr. Sutherland was an Assistant Professor of Radiology in the Mayo Foundation, a Fellow of the American College of Radiology, a member of the Minnesota Radiological Society, the Radiological Society of North America, the American Roentgen Ray Society and an Honorary Member of the Canadian Radiological Society. He also belonged to the medical fraternity, Nu Sigma Nu.

The American Trudeau Society, medical section of the National Tuberculosis Association, has approved the administration of BCG vaccine to nurses, physicians and hospital attendants, who have negative tuberculin tests, because these individuals are almost constantly exposed to tuberculous infection from known and unknown tuberculous patients. It also approves BCG for (1) the Indians, (2) inmates and attendants in institutions for mental patients, and (3) in slum areas in certain large cities where proper housing and living conditions have not as yet been achieved. For the same reason it is justified as a temporary expedient in some countries where the tuberculosis death rate is high and facilities for isolation and treatment almost non-existent. The approval of the Trudeau Society for the use of BCG under these conditions was given with the full knowledge that only slight protection would be achieved and in no sense as a substitute for an adequate program of case finding, isolation, and treatment.—*The NTA Bulletin*, David T. Smith, M.D., March, 1951.

JUNE, 1951

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INFANT MORTALITY IN MINNESOTA, 1950

(Continued from Page 550)

in rats and guinea pigs. Swan and others have pointed out the effects of German measles during the first trimester of pregnancy in producing malformations such as cataracts, cardiac defects, congenital deafness, and dental defects. Although acquired malformations are for the most part preventable, there are as yet insufficient data upon which to base a program for the control of congenital anomalies. The recent advances in pediatric surgery for the treatment of certain congenital malformations previously considered uncorrectable makes it particularly important for physicians to diagnose such anomalies as soon as possible after birth.

The State Department of Health is planning a co-operative study of neonatal mortality similar to the study of maternal mortality now in progress. The proposed study should prove to be as effective as the one on maternal mortality in emphasizing the importance of an early diagnosis as well as the need for a thorough autopsy and in pointing out preventable deaths and developing means for reducing infant mortality in Minnesota. However, further studies of the causes of immaturity, stillbirths and congenital malformations are necessary before it will be possible to develop adequate preventive programs.

Summary

1. A new low in infant mortality was reached in Minnesota in 1950 with a rate of 25.0 per 1,000 live births.
2. The chief causes of death were immaturity, congenital malformations and birth injuries accounting for 61 per cent of all infant deaths.
3. Immaturity was the eighth leading cause of death among all causes in 1950 and congenital malformations were in ninth place.
4. Seventy-six per cent of infant deaths occurred under one month and only 24 per cent between one month and one year.
5. Any sizable reduction in total infant mortality must be achieved during the neonatal period, with emphasis on reduction in deaths due to immaturity, congenital malformations and birth injuries, which together are responsible for 70 per cent of the mortality during the first thirty days of life.

JUNE, 1951

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